

MDT WILDLIFE ACCOMMODATION PROCESS

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Final Report

prepared for

THE STATE OF MONTANA
DEPARTMENT OF TRANSPORTATION

in cooperation with

THE U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

December 2018

prepared by

Kathy Harris, PE, PTOE
KLJ - Helena, MT

Mark Traxler
RESPEC - Helena, MT



RESEARCH PROGRAMS

MDT

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MDT Wildlife Accommodation Process

Final Report

RFP # HWY-311733-SH

Contract # 311733

Project # 5896

prepared by

KLJ

2969 Airport Road, Suite 1B

Helena, Montana 59601

Kathy Harris PE, PTOE

Mark Traxler (RESPEC)

prepared for

Montana Department of Transportation

2701 Prospect Avenue

P.O. Box 201001

Helena, Montana 59620

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16. Abstract Wildlife accommodations are features designed and implemented into a transportation facility to moderate the effects of the infrastructure on wildlife and their habitat. The Montana Department of Transportation (MDT) recognized there is not a defined procedure for addressing wildlife accommodations within their project development process. To date, wildlife accommodations have been addressed on a case by case basis using an informal process that lacked definition and consistency and often resulted in last minute design changes, increased costs, and project delays. The report develops a formal Wildlife Accommodation Process (WAP). The WAP identifies the need for wildlife accommodations early in project development and then recommends wildlife accommodations as part of a new activity (Activity 707/109 for consultant designed projects) – Wildlife Accommodations Recommendations Memo) in MDT’s design process. The Design Team works through an iterative evaluation to determine the wildlife accommodations that will be carried forward into design. A new decision report, the Wildlife Accommodations Decision Report (WADR), documents the accommodations moving forward into design, with decisions summarized in the Scope of Work and other milestone documents which are part of MDT’s design process.			
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EXECUTIVE SUMMARY

Headline News:
“Montana No. 2 in nation for wildlife vs. car collisions”
-Helena Independent Record, September 20, 2016

Headlines, Montana crash records and individual driving experiences all confirm the need for transportation infrastructure to accommodate wildlife into the planning, design, construction, and maintenance activities which are Montana Department of Transportation’s (MDT) project delivery program. Throughout its 105-year history, MDT has continually sought to improve travel, both safety and mobility, throughout the state while melding into Montana’s lands. This includes a stronger sensitivity to the environment in recent decades. MDT has identified its mission “...to serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality and sensitivity to the environment.”

MDT is updating and revising their project delivery program to include a standardized process to assess and justify the needs and feasibility of incorporating wildlife accommodations into MDT’s preconstruction activities. Wildlife accommodations are features designed to moderate the effects of transportation infrastructure on wildlife and their habitat by:

- Reducing or eliminating the potential for wildlife-vehicle conflicts
- Minimizing or eliminating barriers to wildlife movement
- Protecting important habitat components within the landscape.

This report summarizes MDT’s two-year effort to develop a formal process to define and incorporate consideration of wildlife accommodations within their project delivery system, specifically, in the early stages of project design, also called preconstruction by MDT. A technical panel comprised of key MDT functional area representatives and the Federal Highway Administration (FHWA) formulated the process over a two-year period in concert with a consultant team comprised of KLJ, Inc. and RESPEC, Inc.

A review of national literature reinforced that no “one-size fits all” and resulted in no suitable examples for the process of determining wildlife accommodation inclusion into a design process. Concurrent with the literature search, KLJ interviewed 45 Montana professionals in the transportation or wildlife sciences to assess current perceptions, perceived needs, and the need for a successful Wildlife Accommodations Process (WAP).

The WAP is a standardized process to assess and justify the needs and feasibility of incorporating wildlife accommodations into MDT preconstruction projects. This is done by integrating input from wildlife scientists with iterative design considerations by the comprehensive Design Team. WAP does not address development of design standards for wildlife accommodations or the construction and maintenance processes that are a part of MDT’s day-to-day business.



The WAP:

- Begins with a wildlife needs assessment early in project development and documents the needs, if any, in the project Biological Resources Report / Preliminary Biological Assessment (BRR/PBA). The needs assessment completed by the MDT District Biologist or consultant considers animal/vehicle collision data, wildlife movement patterns, wildlife populations, and other data to address wildlife-related concerns as part of a proposed project.
- Continues under a new preconstruction Activity 707 (Consultant Activity 109) which requires the District Biologist to prepare a Wildlife Accommodations Recommendations Memo (WARM) detailing project – specific wildlife accommodation(s) for further consideration by the Design Team. The WARM is distributed to the Design Team under the signature of the Environmental Services Bureau Chief during Alignment and Grade (AGR) development.
- Initiates an iterative evaluation to evaluate the feasibility of each wildlife accommodation recommended and the potential for moving individual accommodations into final design of the project.
- Documents the Design Team's consensus and justification for including, modifying or excluding the wildlife accommodation in a Wildlife Accommodations Decision Report (WADR) completed by the Project Design Manager. These wildlife accommodation decisions will also be briefly discussed in the Scope of Work (SOW) report and other milestone documents as applicable.

In addition to defining the changes to project delivery, this report provides an implementation plan for MDT, suggests performance measures for the WAP, and offers a process to review and provide adaptive management adjustments (for WAP in the future). A Desk Guide has been developed to serve as a quick reference for MDT staff and outside partners.



CHAPTER 1 INTRODUCTION

1.1 Report Purpose

This report summarizes a two-year effort by the Montana Department of Transportation (MDT) to develop a formal process to define and incorporate consideration of wildlife accommodations within their project development process. Initiated by the MDT Environmental Services Bureau, the effort utilized a consultant team and a Technical Panel to:

- Review existing practices in the industry with a literature search
- Interview MDT staff and Montana stakeholders to define needs, issues and opportunities
- Develop definitions and processes to be added into MDT's project delivery program
- Document the Wildlife Accommodation Process (WAP) and integrate into MDT project development process through updating of preconstruction activities and report modifications within MDT's project delivery program.

The WAP primarily occurs during preconstruction while seeking input from Design Team members, including Planning, District, Construction, and Maintenance.

1.2 Wildlife Accommodation Definition and Objective:

MDT defines a Wildlife Accommodation as:

A feature or strategy designed and implemented into a transportation facility to moderate the effects of the infrastructure on wildlife and their habitat.

MDT's objectives for Wildlife Accommodations are:

To minimize or eliminate barriers to wildlife movement, protect important habitat components within the landscape, and reduce or eliminate the potential for wildlife-vehicle conflicts.

1.3 Development of Wildlife Accommodations Process

Over the past 20 years, MDT has incorporated wildlife accommodations into dozens of projects across Montana. Individual implementation sometimes lacked predictability and consistency resulting in late design changes, Design Team frustration, and/or project delays. These delivery impacts led to overarching support from MDT functional areas for development and inclusion of a wildlife accommodations process into MDT's project development process.



The WAP establishes changes to MDT's preconstruction activities that will facilitate inclusion of wildlife accommodation recommendations in the early stages of project development; emphasizing quality, safety, cost effectiveness and sensitivity to the environment while providing transportation services to the traveling public. The Technical Panel determined that modifications to existing activities and the addition of one new activity were the best way to consistently and predictably identify and include appropriate wildlife accommodations across Districts and projects.

1.4 Technical Panel

The Technical Panel represented key MDT functional areas and the Federal Highway Administration (FHWA) with members shown in Table 1-1. These members worked diligently with the consultant in formulating the new process and brought a broad range of expertise to the research project. The Technical Panel is expected to participate in implementation of the WAP including training, periodic review of the process and evaluation of WAP performance measures.

Table 1-1: Technical Panel

Bill Semmens	Chair, MDT – Environmental Services Bureau
Tom Martin	MDT – Environmental Services Bureau
Deb Wambach	MDT – Environmental Services Bureau
Nathan Haddick	MDT – Bridge Bureau
Kent Barnes	MDT – Bridge Bureau
Lesly Tribelhorn	MDT – Highways Bureau
Jennifer Nelson	MDT – Butte District
Shane Stack	MDT – Missoula District
Matt Collingwood	MDT – Construction Engineering Services Bureau
Heidy Bruner	FHWA
Brian Hasselbach	FHWA
Sue Sillick	MDT – Research Section
Kris Christensen	MDT – Research Section



1.5 Consultant Team

Through the Research Section, MDT requested proposals for developing a WAP. After proposal submittal and interviews, the team of KLJ and RESPEC was selected in 2016. Kathy Harris, a professional engineer at KLJ with over 25 years of highway project development experience served as primary investigator while Mark Traxler, a senior wildlife biologist with RESPEC, served as a secondary investigator. Ms. Harris and Mr. Traxler attended all Technical Panel meetings where they facilitated discussion among the Technical Panel members, prepared concepts and documents for Technical Panel review and authored the final documents. Consultant team members are listed in Table 1-2.

Table 1-2: Consultant Team

KLJ	Kathy Harris, PE PTOE	Primary Investigator
	Jennifer Davis, EI	Researcher
	Roselyn Perrigo	Technical Document Specialist
	Katherine Pustejovsky	Proof Reader
	Nichole Fischer	Graphic Artist
RESPEC	Mark Traxler	Secondary Investigator



CHAPTER 2 LITERATURE REVIEW

MDT wanted to consider the efforts undertaken by other states or agencies with regard to wildlife accommodation guidance or policies. A review of national literature was conducted to seek examples of a defined WAP in the preconstruction phase of transportation projects. While many states had developed wildlife design standards or had monitored performance of wildlife features, few states had defined a standardized business process for inclusion of wildlife accommodations in their project development process.

Figure 2-1 presents the sixteen states found to have wildlife policies, guidelines or strategies and the subset of seven states with defined wildlife recommendation processes within the preconstruction phase.

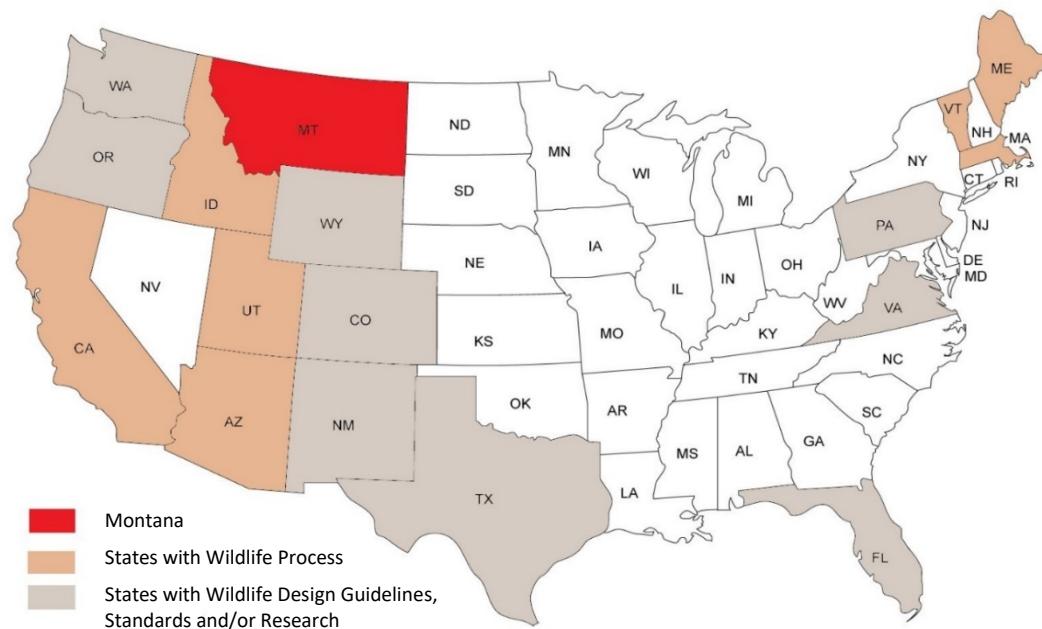


Figure 2-1: States with Wildlife Guidance or Process within Transportation Projects

Table 2-1 provides an overview of the seven states with defined wildlife recommendation processes.

Table 2-1: Wildlife Process Concepts for MDT Consideration

State	Summary of Wildlife Process or Guidance	Issues for MDT Usage
Arizona	Priority chart to rate biological values against threats and opportunities	Biological process but not a business model or process tool
California	<ul style="list-style-type: none"> ▪ Defined a detailed process at earliest stages of project ▪ Developed detailed decision trees ▪ Defined adaptive management steps during latter stages of project life 	Process and complex decision trees require extensive work effort to support guidance requirements
Idaho	Systematic, numerical formula to establish wildlife crash locations and establish priorities to begin mitigation actions	Developed for recorded wildlife crash locations only
Maine	Policy signed between Transportation and Natural Resource Departments	Focused on aquatic organisms
Massachusetts	Highway Manual includes wildlife chapter with: <ul style="list-style-type: none"> ▪ Decision tree for design integration ▪ Defines situation to apply wildlife accommodations ▪ Eight defined initiatives 	Focused on existing roads and bridges
Utah	Toolkit with: <ul style="list-style-type: none"> ▪ Defined data collection process ▪ Inclusion with planning and programming ▪ Defined project development ▪ Recommended future actions: ▪ UDOT policy to be developed ▪ Memoranda between Transportation and Natural Resource Departments 	At the time of this writing, unable to locate policy or memoranda that were to be developed per recommendations
Vermont	Minimal five-step process for defining wildlife connectivity and movement	At the time of this writing, unable to locate policy that was to be developed per recommendations

This Literature Review demonstrated that each state focused on specifics for their individual needs. The review of national research and peer states reinforced that no “one-size fits all” and did not provide a suitable template that fit most aspects of MDT’s desired outcome. The Literature Review was detailed in Interim Report #1 for this project and is contained in Appendix A.

CHAPTER 3

INTERVIEWS

The consultant team originally proposed interviewing a small number of MDT staff to identify current conditions, opportunities and challenges related to incorporating wildlife accommodations into MDT's project delivery program. After the first Technical Panel discussion, MDT requested additional interviews to more broadly identify the current understanding of wildlife accommodations and existing MDT processes regarding their recommendations and inclusion in project development. 37 interviews were held between the principal investigator and a total of 45 professionals in the transportation or wildlife professions between June and September 2016. These interviews provided a compilation of current and past experiences of interdisciplinary transportation professionals, resource agency (RA) professionals, tribal representatives and other transportation or wildlife experts with a broad range of backgrounds.

Each interview began with a sample list of interview questions but often deviated based upon the experiences of the interviewee. The interviews were detailed in Interim Report #1 and are contained in Appendix A, along with the sample list of interview questions.

3.1 Summary of Interviews

The interview results were subsequently incorporated into the development of the WAP and assisted in focusing upon department-wide needs, timing, interaction, and communication issues. Consistent themes identified in the interviews are summarized below:

- MDT needs an iterative design process (this was often stated in general; not only specific to wildlife accommodations)
- Wildlife accommodations need to be identified early and scoped before going to design
- Wildlife accommodations need to have a defensible justification for inclusion (or exclusion) and should address operations and maintenance
- Obtain MDT Management support and leadership

Consistent interview themes that were not incorporated as part of this research project but tabled for future consideration include:

- MDT has made progress toward addressing wildlife issues, but work is still needed
- Need design standards or guidelines for wildlife accommodations
- Identify potential for wildlife habitat needs and accommodations prior to project nomination
- Develop baseline of wildlife movement / connectivity corridors for future use in MDT project scoping;
- Consider if federal funding could support monitoring of wildlife accommodations built into transportation facilities
- Educate regulatory and resource agencies on MDT's mission and project development process
- Capture wildlife loss, impact and conservation data accurately and integrate into MDT's data-driven decision process (overlaps into benefit-to-cost ratio)
- Collect wildlife carcass data accurately and consistently
- Measure wildlife accommodation benefits for incorporation into MDT's performance-based, practical design
- Consider or establish state-wide pool or alternate funding program(s) for wildlife accommodations
- Incorporate fencing commitments (primarily for wildlife friendly fencing) as part of MDT's Design Phase (currently completed in the Right-of-Way Phase)
- Justify wildlife accommodation decision based upon data



CHAPTER 4 WILDLIFE ACCOMMODATION PROCESS (WAP)

4.1 Wildlife Needs Assessment

This process was specifically designed to identify the potential need for wildlife accommodations early in the project development process and incorporate into the comprehensive nature of road project development by formally including input from multiple functional areas of MDT.

Following the Preliminary Field Review (PFR), the District Biologist identifies and presents wildlife needs in the Biological Resources Report/Preliminary Biological Assessment (BRR/PBA) under Activity 706 (or Consultant Activity 182). The Technical Panel identified this activity as the appropriate starting point for assessing the wildlife needs. The Table of Contents template for project BRR/PBA's will be updated to include a section specific to Wildlife Accommodation Needs and Opportunities (see updated BRR/PBA Table of Contents in Appendix B). This new section of the BRR/PBA specifically includes the following subsections:

➤ Methods:

- Agency Coordination and Consultation
- Literature Reviews and Database Searches
- Animal Carcass and Animal/Vehicle Crash Analysis
- Field Survey Protocol

➤ Needs Analysis:

- Discuss the species present in the project area, movement patterns including trails, sign, carcasses, live animals, collision and carcass data, etc., barriers to wildlife movement, habitat suitability, adjacent land use, and any wildlife needs that may warrant accommodation with the project.

➤ General Recommendations:

- Make general conceptual recommendations that may address these needs for consideration during project development. Include discussion of any environmental or apparent project constraints that might be affected by or affect the feasibility of certain accommodations for further analysis by the Design Team.



4.2 Wildlife Accommodation Options, Recommendations and Decision

4.2.1 Wildlife Accommodations Recommendations Memo (WARM)

Following preparation of the BRR/PBA, the District Biologist considers wildlife needs and prepares a Wildlife Accommodations Recommendations Memo (WARM) under the newly established Activity 707 (or Consultant Activity 109) documenting the project specific wildlife accommodation recommendations for further consideration and feasibility analysis by the Design Team. The WARM was assigned a new activity number as it did not closely align with existing activity descriptions, and the intent is to include wildlife accommodation recommendations in a more consistent manner earlier into the project development process. The WARM will be distributed to the Design Team under the signature of the Environmental Services Bureau Chief during initial Alignment and Grade (AGR) development.

The Technical Panel prepared a memo template for consistent formatting of the WARM (see Activity 707/109 and WARM template in Appendix C). The WARM includes the following sections:

- Proposed Scope of Work
 - Brief description from most recent milestone document
- Project Location and Limits
 - Brief description from most recent milestone document
- Wildlife Needs Analysis Summary
 - Summary of the wildlife needs, and general recommendations provided in BRR/PBA
- Wildlife Needs Verification and Supporting Documentation
 - Discussion of additional work completed following the BRR/PBA to verify animal movements, carcasses, collisions, land-use, and other relevant data for the areas with wildlife needs. Discuss coordination with Resource and Tribal Agency wildlife personnel as necessary. Document any changes from data or analysis previously reported in the BRR/PBA.
- Wildlife Accommodations Recommendations
 - Enumerate wildlife accommodations by project location. Location can be identified by reference post range, station range, intersecting roadways, or geographic features, etc.
 - Discuss the accommodation type(s) and focal species. Include rationale for the location and type (safety and/or connectivity data,

agency coordination, public input, literature review, environmental commitments, logistics, opportunity, etc.). Discuss expected benefits of the wildlife accommodation to public safety and/or wildlife connectivity.

- Discuss current adjacent land use and any documented future land use changes (platted for subdivision, etc.). Document any previous landowner and/or land management agency coordination or if future coordination is needed, existing or potential easements or protections, etc.
- Provide a planning-level cost estimate for the wildlife accommodation including capital investment, operation and maintenance. Coordination with the Design Team is encouraged at this stage to estimate wildlife accommodation costs. A range of costs may be appropriate if an accommodation can be constructed using different materials or methods. Identify operation and maintenance needs and anticipated schedule for the accommodation.
- Identify design elements (grade, right-of-way, structure sizes, natural or cultural resources, geotechnical or hydraulic considerations, constructability, etc.) that may be potentially affected, or affect the recommended wildlife accommodation. Identify the appropriate MDT functional areas for further coordination and feasibility analysis.
- Discuss the need for further coordination with land owners, resource and/or Tribal agencies, or manufacturers of wildlife accommodation technology. Identify if additional research is needed prior to issuance of the Wildlife Accommodation Decision Report (WADR).

4.2.2 Iterative Evaluation

Following distribution of the WARM, the entire Design Team works through an iterative evaluation during alignment and grade preparation to evaluate the feasibility of each recommendation and the potential for moving these recommendations into design. Through this iterative process, potentially challenging or fatal design flaws are examined and discussed. These design considerations must be worked through, documented, and will ultimately influence the final decisions to accept, modify, reject, or propose alternate wildlife accommodations for the project. These decisions will be documented in the WADR which is included in Appendix D.

4.2.3 Wildlife Accommodations Decision Report (WADR)

Following preparation of the WARM and the iterative evaluation, the Project Design Manager prepares the WADR based upon input from the Design Team. The Technical Panel prepared a memo template for consistent formatting of the WADR. The WADR documents decisions and justification/rationale to accept, modify, or reject the recommendations made in the WARM.



The WADR briefly describes each recommendation provided in the WARM one by one, and states whether the recommendation has been:

- Accepted as recommended – Provide concise direction to the Design Team for inclusion of the wildlife accommodation into the project design.
- Accepted Modified (Modified accommodations meet the intent of the original recommendation but alter the design to achieve feasible inclusion in the project) – Provide a summary of why the original recommendation was deemed infeasible. Provide a clear description of the proposed modification(s). Provide concise direction to the Design Team for including the modified wildlife accommodation into the project design.
- Rejected – Provide a summary of the factors considered by the Design Team. Provide clear justification and rationale for not incorporating this wildlife accommodation into the project design.
- Accepted Alternate (Alternate accommodations are wildlife accommodations that were not originally included in the WARM. They do not meet the intent of the original recommendations in the WARM but were determined by the Design Team to be feasible wildlife accommodation options for inclusion in the project) – Provide concise direction to the Design Team for including the alternate wildlife accommodation(s) into the project design.

Example discussions are provided in the WADR template in Appendix D. Decisions regarding wildlife accommodations are considered final with this report. These decisions will be briefly summarized in the Scope of Work (SOW) report and forwarded into final design.

4.3 Changes to Milestone Reports

The Technical Panel concurred that minor additions to the MDT Milestone reports would capture the design concept history and decisions for the consideration of wildlife accommodations in each project. The following changes to the milestone report templates will be executed as part of the overall implementation of the WAP.

4.3.1 PFR or Combined Preliminary Field Review and Scope of Work Report (PFR/SOW)

Add an additional paragraph within the Environmental Considerations section which states:

- Summarize the wildlife needs and general recommendations for wildlife accommodations for consideration in project development. If no wildlife needs are identified or accommodations are not feasible based on project scope, indicate that wildlife accommodations will not be considered for the project.

4.3.2 AGR Report

Add an additional paragraph within the Environmental Considerations section which states:

- Summarize recommended wildlife accommodation options (from the WARM) and subsequent efforts to identify the type and feasibility of accommodations currently under consideration. If no wildlife needs are identified or accommodations are not feasible based on project scope, indicate that wildlife accommodations will not be considered for the project.

4.3.3 SOW Report

Add an additional paragraph within the Environmental Considerations section which states:

- Summarize the decisions and rationale for inclusion or exclusion of recommended wildlife accommodations as documented in the WADR. If no wildlife needs are identified or accommodations are not feasible based on project scope, indicate that wildlife accommodations will not be considered for the project.

4.3.4 Plan-In-Hand Report (PIH)

Add an additional paragraph within the Environmental Considerations section or by plan sheet if not available, to address the design elements associated with the wildlife accommodations forwarded into design. Include any special provisions required for construction of the wildlife accommodations.

4.3.5 Final Plan Review Report (FPR)

Add an additional paragraph within the Environmental Considerations section or provide comments as appropriate to address final design elements associated with the wildlife accommodations forwarded into design. Include any final revisions to special provisions required for construction of the wildlife accommodations.

4.4 Implementation of WAP

4.4.1 Desk Guide

The Desk Guide is intended to be an introduction of the process to new staff and serve as a quick reference for existing staff. The Desk Guide is included in Appendix E of this report and will be distributed to MDT functional areas and design consultants for future reference.

4.4.2 Training Recommendations

Buy-in and participation from nearly all functional areas of MDT is essential to the successful implementation of the WAP. Introductory and educational training is encouraged. Training would focus on changes to the project delivery flow charts, new activities and document format changes, wildlife accommodations design responsibilities by bureau, and why MDT is committed to these changes. Training opportunities should occur in the districts and at headquarters early in process rollout and as needed into the future. Training will be presented by the members of the Technical Panel and consultant team. Following the initial training, all staff will have access to this report and the Desk Guide for quick reference. The Technical

Panel will be a resource available to staff to address specific questions and to provide additional guidance as needed.

4.4.3 Implementation Plan

Full implementation of the WAP involves a number of steps that need to be completed by MDT prior to the official “rollout” date, and for a period of time following rollout. Implementation involves updating flow charts, report templates, and activity descriptions. Table 4-1 below presents the implementation steps recommended for completion. All implementation steps are the responsibility of MDT, with the exception of I-5 which is scheduled to be completed in August 2018.

Table 4-1: Implementation Plan

Step #	Activity
Implementation:	
I-1	Prepare WARM Activity Description and assign WARM Activity Number.
I-2	Update Flow Charts <ul style="list-style-type: none"> ➢ Bridge Replacement ➢ Bridge Replacement Road Design ➢ Consultant Design ➢ Road Design Rural and Urban – New Construction & Reconstruction ➢ Road Design Urban and Rural – Resurface ➢ Road Design Rural and Urban –Resurface and Widen ➢ Road Design Rural and Urban –Safety and Spot Improvement ➢ Traffic Safety Design
I-3	Update Report Templates <ul style="list-style-type: none"> ➢ PFR Report ➢ PFR/SOW Report ➢ BRR/PBA Table of Contents ➢ BRR/PBA Report ➢ AGR Report ➢ SOW Report ➢ PIH Report ➢ FPR Report
I-4	Update Activity Descriptions <ul style="list-style-type: none"> ➢ 128 (SOW Report-Consultant) ➢ 214 (SOW Report-MDT Road Design) ➢ 566 (SOW-MDT Bridge) ➢ 182 (Prepare BRR/PBA-Consultant) ➢ 706 (Prepare BRR/PBA-MDT)
I-5	Summarize WAP to MDT Division and District Administrators, FHWA, Bureau Chiefs, and other supervisors. (completed by consultant in August 2018)
Rollout	
I-6	Rollout New Activities, Flow Charts, Templates on internal and external web links. Distribute Desk Guide.
I-7	Present to Staff and (select) Consultants and provide staff level training. Distribute Desk Guide to functional areas and design consultants.
I-8	Initiate project-level tracking spreadsheet creation by Environmental Services Bureau.



4.5 WAP Performance Measures

MDT proposes to conduct annual surveys of staff from Planning, Preconstruction, Construction, and Maintenance for a period of five years following the WAP implementation to measure its effects on MDT's project development, project delivery and stakeholder satisfaction. The survey is currently planned to seek a qualitative response to performance related questions that would be rated on a scale from 1 to 5. The survey would address the overall buy-in, predictability and consistency of the WAP. A separate, project-level tracking spreadsheet, identified as I-8 above, is recommended to quantitatively measure the specific steps within the WAP on active MDT projects. Also, the tracking spreadsheet would address specific projects where wildlife accommodations were recommended. The Environmental Services Bureau and Technical Panel would develop the annual survey and project tracking spreadsheet to focus on questions including:

- Is the WAP predictable and well defined?
- Is the WAP being implemented consistently throughout MDT?
- What aspects of the WAP could be improved to streamline project delivery? How?
- Is the WAP resulting in project delivery schedule and/or preliminary engineering expenditure efficiencies? If not, what aspects of the WAP could be adjusted to improve either schedule or expenditure efficiencies?

The Technical Panel suggested that the five performance measures defined in Table 4-2 may provide the framework for the survey questions. Table 4-2 also lists a number of topics for discussion by the Technical Panel following receipt of survey results. These topics may be revised annually, based upon survey results.

Table 4-2 WAP Performance Measures

Step #	Activity	Owner
	Rate the following items on a scale from 1 (not addressed) to 5 (clearly and completely addressed). Provide comment section.	
PM 1	Wildlife needs and general wildlife accommodation (WA) recommendations are clearly defined in the BRR/PBA.	Environmental Services Bureau, with Technical Panel support, will conduct the survey of MDT staff
PM 2	WA recommendations are clearly defined in the WARM.	
PM 3	The milestone documents addressed WA appropriately.	
PM 4	The Design Team was actively engaged in the decision-making process pertaining to WA recommendations and implementation.	
PM 5	WA decisions and justifications are clearly documented in the WADR.	
	Discussion	
	For performance measures receiving a score of 3 or less, discuss the following at annual process review meeting: <ul style="list-style-type: none"> ➤ Are there common issues or roadblocks to full implementation and at what stage(s) in the process do improvements need to be made? ➤ Are staff roles and responsibilities for the WAP process not fully understood by staff? Is additional training needed? ➤ Is staff buy-in and implementation of the WAP inconsistent? Why? ➤ Are adaptive management strategies needed to improve the process? 	Technical Panel



CHAPTER 5

WAP REVIEW

This chapter provides a framework for the developers of WAP, the Technical Panel, to review its implementation and effects and to determine adaptive management strategies as needed in the future. This WAP Review is envisioned to occur for approximately five years, after which time the process should be integrated into the normal course of business. The WAP Review will evaluate the five performance measures identified in Table 4-2 and will track project-level implementation using a tracking spreadsheet identified in Table 4-1 as I-8.

Table 5-1: WAP Review

Step #	Activity	Owner	Time Frame
PR 1	Populate project-level tracking spreadsheet.	Environmental Bureau Chief (or as assigned)	Annually
PR 2	Prepare an annual Process Review Report that reviews the WAP Performance Measures and the project-level tracking. Reconvene the Technical Panel to discuss report results. Evaluate if the annual Process Review Report is needed for upcoming year.	Environmental Bureau Chief (or as assigned)	One Year after implementation and then as needed.

CHAPTER 6 FUTURE CONSIDERATIONS FOR WAP

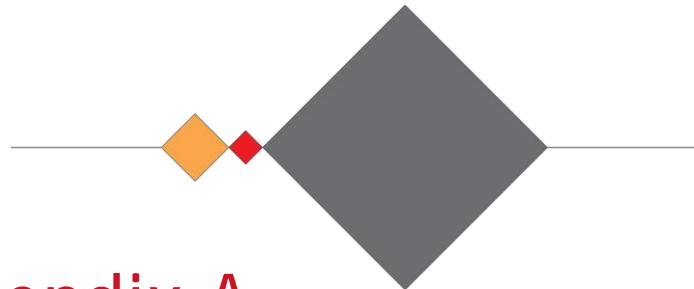
The WAP was specifically established to address wildlife and transportation interactions early and in a consistent and predictable manner for MDT. A number of wildlife and transportation considerations were not explicitly addressed by or were omitted from the final process development but are important components of MDT's mission and overarching vision. These matters are captured below for future consideration:

- Develop tools or processes to consider wildlife accommodations before or in the project nomination phase.
- Inform and educate MDT Planning staff (with fiscal planning responsibilities) to understand and plan funding for wildlife accommodations.
- Develop design guidance for wildlife accommodations.
- Develop and implement a standardized Benefit/Cost analysis for wildlife accommodations.
- Develop a statewide priority wildlife linkage assessment.
- Monitor and measure the effectiveness and performance of wildlife accommodations.
- Integrate wildlife accommodations into MDT's culture for integrated design consideration.
- Consider whether wildlife accommodations should be integrated into Performance Based Design approach
- Consider how surrounding land use and potential for major land use changes should be integrated into design decisions.
- Develop funding sharing mechanisms to expand the research in areas of wildlife and transportation interaction.
- Develop resource agency's understanding of MDT roles, responsibilities, and requirements.

CHAPTER 7 REFERENCES

Helena Independent Record. "Montana No. 2 in nation for wildlife vs. car collisions." September 20, 2016.





Appendix A

*Interim Report #1, Overview of Literature Review
and Interviews*



Overview of Literature Review and Interviews

MDT Wildlife Accommodation Process
Interim Report #1-Third Draft

prepared by

KLJ
2969 Airport Road, Suite 1B
Helena, Montana 59601



prepared for

Montana Department of Transportation
2701 Prospect Avenue
P.O. Box 201001
Helena, Montana 59620

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CHAPTER 1

INTRODUCTION

Headline News:
“Montana No. 2 in nation for wildlife vs. car collisions”
-Helena Independent Record, September 20, 2016

This type of headline is troubling. Montana crash records and individual driving experiences confirm the need for road systems to accommodate wildlife into the planning, design, construction, and maintenance functions. This report summarizes the first steps that will formally define a process for Montana Department of Transportation (MDT) to address wildlife accommodations in the delivery of transportation projects in step with MDT's mission statement.

The Wildlife Accommodations Process (WAP) is planned to develop a standardized process to assess and justify the need and feasibility of incorporating accommodations for wildlife species into MDT projects. This includes formal steps, activities, reviews, or other actions that will fit within the current business process that MDT utilizes to manage project delivery. The WAP will not address the significant construction and maintenance processes that are a part of MDT's day-to-day business nor will it define design standards for wildlife features that may be incorporated into a roadway project.

MDT's mission statement:

“MDT's mission is to serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality and sensitivity to the environment.”

In its 103-year history, MDT has continually sought to improve travel, both safety and mobility, throughout the state while melding into Montana's lands. In recent decades, a stronger sensitivity to the environment has emerged. During this time, MDT has also moved toward data-driven decisions and is continually modifying its project delivery system.

1.1 Wildlife Accommodation Definition

MDT defined wildlife accommodations as:

“A feature or strategy designed and implemented into a transportation facility to moderate the effects of the infrastructure on wildlife and their habitat. The objective is to minimize or eliminate barriers to wildlife movement, protect important habitat components within the landscape, and reduce or eliminate the potential for wildlife-vehicle conflicts.”

1.2 Report Purpose

MDT sought federal transportation research funds to develop a documented process, based upon peer state and local issues, to define and treat wildlife accommodations within MDT’s project delivery process. MDT retained KLJ to facilitate development of the process. The WAP development will work through an MDT led Technical Panel.

The Overview of Literature Research and Interviews report is the first in a series of reports to document and define the WAP and will be submitted to the Technical Panel in sections, as Interim Reports are completed. This report summarizes the two areas of data collected in the initial research:

- A review of national practices
- Assessing Montana-based wildlife experiences through interviews with key, professional staff.

1.2.1 Literature Review

A review of national literature included a peer state review to determine current level of practice. The investigation identified that few states have defined a process (of specific steps) to identify wildlife needs and incorporate appropriate wildlife features into the various design processes leading to construction of a transportation project. While many states have developed wildlife design standards or monitored effectiveness of wildlife features, MDT desires to focus on the process of identifying the need, assessing the options, justifying features that benefit both users traveling on roadways and the surrounding wildlife.

Sixteen states were found to have relevant wildlife process guidance or policy development but reinforced that there is no “one-size fits all”. Of these sixteen states, seven states provided wildlife-related guidance, tools or ideas that are recommended for consideration as possible tools, methods or concepts in the next stages of developing MDT’s WAP. Table 2-3 (page 7) presents concepts suitable for future use from these

seven states. While the seven peer states offer useful ideas with regard to the WAP effort, none of the peer states fit entirely for Montana.

1.2.2 Interviews

The research team originally proposed interviewing a small number of MDT staff to identify current conditions, opportunities and challenges related to incorporating wildlife accommodations into MDT's current project delivery system. After the first Technical Panel discussion, MDT requested additional interviews to better delve into existing conditions. Thirty-seven interviews were held between the principal investigator and a total of forty-five professionals in the transportation or wildlife science fields.

These interviews provided a compilation of current and past experiences of interdisciplinary transportation professionals, resource agency (RA) professionals, tribal representatives and other transportation or wildlife experts across the state. The interviews provided additional understanding of the challenges of MDT project delivery and will be used to help define the next steps of this WAP development.

CHAPTER 2 LITERATURE REVIEW

2.1 National Research

Transportation agencies have struggled to address the challenge of integrating wildlife accommodations into the roadway and roadside network. State, provincial and even international efforts use a variety of methods, ranging from detailed work processes to no defined approach.

To provide a baseline for Montana's effort, this section summarizes an overview of peer states with regard to wildlife related policies, guidelines and strategies. While many states have wildlife design guidelines and standards and many have completed wildlife-related research efforts, only seven states were found with applicable process-related documentation. Those seven states are shown in Figure 2-1 and are presented in this chapter. Additionally, nine more states were considered but did not have a compelling or defined process and offered little in the way of new information but are summarized in Appendix A - 1.

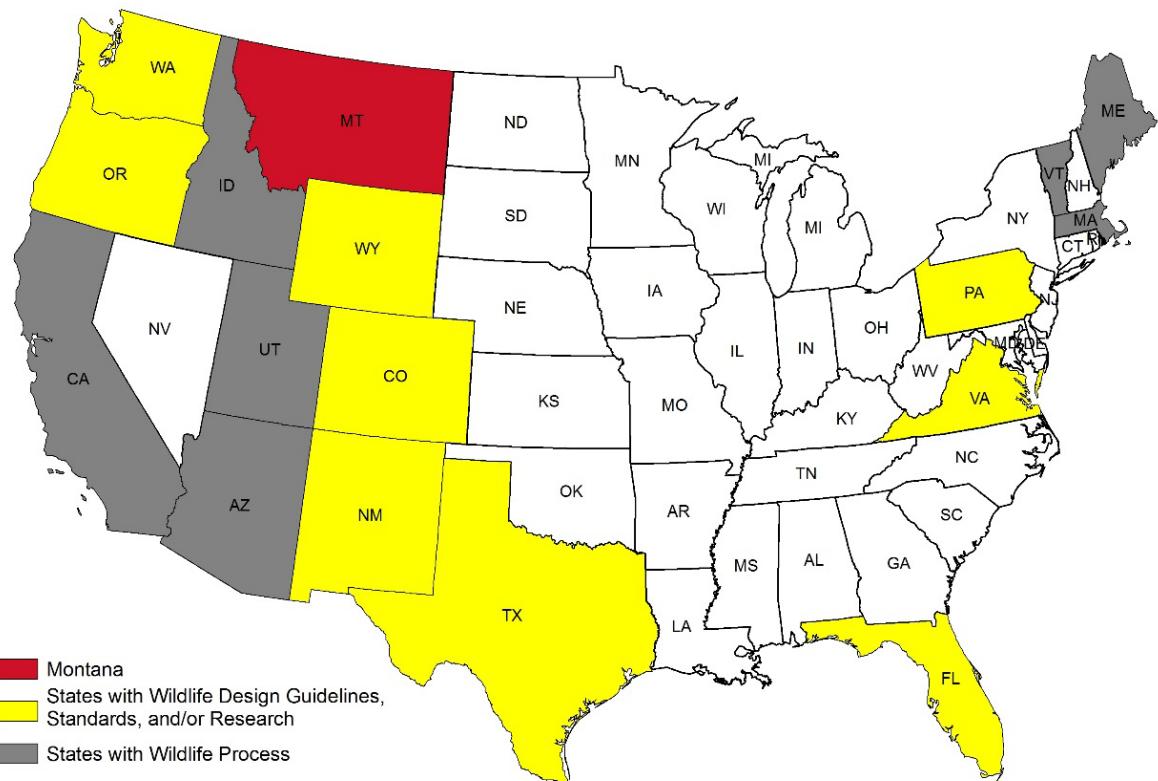


Figure 2-1: States Researched

Since each agency's approach is structured differently, this section provides an overview of reviewed processes rather than a direct comparison between processes. Identifying the processes provides insights for developing Montana's approach and strategies.

As there are no uniform wildlife standards for each state, wildlife accommodation data was searched for all fifty states using the key terms: wildlife crossing, wildlife process, wildlife accommodation and wildlife-vehicle mitigation. Due to the purpose of developing a state-based process, efforts by the Federal Highway Administration (FHWA) and other federal or research agencies that focused on national research and design guidance are not included in this report.

Tables 2-1 and 2-2 provide overall summaries of the reports and focus areas for each peer state. The states listed in Table 2-2 were found to have process or policies that may be useful in development of MDT's process development and are discussed in greater detail below. Further summaries including goals and outlines for process development of all the states noted in Table 2-1 can be found in Appendix A - 1.

Table 2-1: States with Wildlife Documents

State	Document Related to:			
	Process	Design Policy, Guidance and/or Standard	Research and Monitoring	Connectivity or Linkage Study
Arizona	X	X	X	X
California	X	X		
Colorado			X	
Florida		X		
Idaho	X		X	X
Maine	X	X		
Massachusetts	X	X		
New Mexico			X	
Oregon			X	X
Pennsylvania		X		
Texas			X	
Utah	X		X	
Vermont	X	X	X	
Virginia			X	
Washington			X	X – Pending
Wyoming			X	



Table 2-2: States with Relevant Wildlife Process Guidance

State	Date	Report Author	Document Length (pages)
Arizona	Multiple	Arizona Department of Transportation	Varies
California	2009	Information Center for the Environment, Department of Environmental Science and Policy, University of California	111
Idaho	2014	Utah State University	280
Maine	2008	Maine Department of Transportation	128
Massachusetts	2006	Massachusetts Department of Transportation	30
Utah	2005, 2012	Wildlife QIT, Utah State University	37 181
Vermont	2012	Vermont Agency of Transportation	102

Each of the seven states has developed their own process guidelines, dependent upon individual state policies, project delivery systems and wildlife needs. The seven states identified with relevant documents provide baseline ideas to implement MDT's WAP. Table 2-3 summarizes relevant issues, comments and items to consider in MDT's process development with details provided in the following section.

Table 2-3: Wildlife Process Concepts for MDT Consideration

State	Detriment	Possible Concept to Capture for MDT
Arizona	After review, not a business model process	Priority chart to rate biological values against threats and opportunities
California	Requires extensive work effort to support guidance requirements. Decision trees are fairly complex.	<ul style="list-style-type: none"> Defined a detailed process at earliest stages of project Developed detailed decision trees Defined adaptive management step during latter stages of project life.
Idaho	Developed for wildlife crash locations only	Systematic, numerical formula to establish wildlife crash locations and establish priorities to begin mitigation actions.
Maine	Focused on aquatic organisms	Policy signed between Transportation and Natural Resource Departments.
Massachusetts	Focused on existing roads and bridges	Highway Manual includes wildlife chapter with: <ul style="list-style-type: none"> Decision tree for design integration Defines situation to apply wildlife accommodations Eight defined initiatives
Utah	Unsure if policy or memoranda were developed	Toolkit with: <ul style="list-style-type: none"> Defined data collection process Inclusion with Planning and Programming Defined project development Recommended: <ul style="list-style-type: none"> UDOT policy to be developed Memoranda between Transportation and Natural Resource Departments
Vermont	Unsure if policy was developed.	Minimal five-step process for defining wildlife connectivity and movement.

2.2 Peer States Process Highlights

This section details relevant agency's process for their wildlife accommodations. Additionally, comments are provided on areas that were unique or worthy of future consideration in developing Montana's process. The comments are subjective but do provide consideration for work plan and process development.



2.2.1 Arizona

The Arizona Department of Transportation (ADOT) has developed several environmental and technical guidance documents relating to wildlife connectivity. These documents include a wildlife connectivity guidance (ADOT, Undated) document and a wildlife linkage (Nordhaugen, 2006) assessment that have relevant information summarized below. Other ADOT documents discuss wildlife escape measures and wildlife funnel fencing that primarily contain design standards and are not summarized below or in Appendix A - 1.

Arizona's foremost connectivity tool is the 2006 Arizona's Wildlife Linkages Assessment. This comprehensive effort identifies and prioritizes 152 different landscape-scale linkages across the state in terms of their respective biological value and threat and opportunity values. Figure 2-2 represents the prioritization of linkage zones, relative to each other. The horizontal axis reflects the Biological Value while the vertical axis reflects a calculated Threat and Opportunity Value. Linkage zones in the upper right quadrant would have the higher priority, resulting in more detailed planning and conservation actions. Presently, 16 linkages have undergone refined analysis using species-specific GIS-based habitat models for least-cost path determination of corridors.

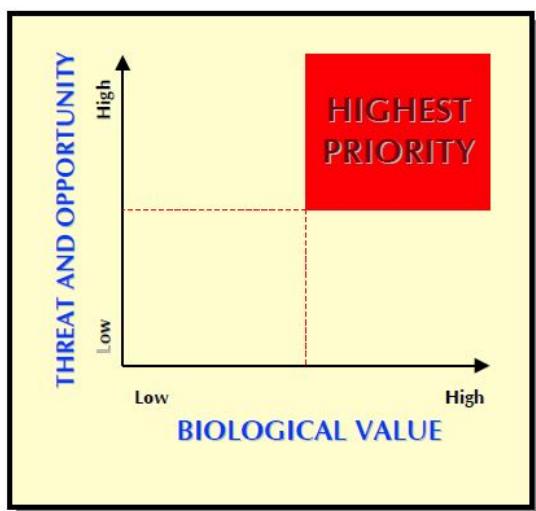


Figure 2-2: ADOT Linkage Zone Ratings

As part of development of this tool, two workshops were held with biologists, land managers, planners and engineers to develop the linkage zones and priorities.

- The Biological Value reflects the overall importance of a potential linkage zone with criteria specific to associated habitat blocks. Eight criteria are used to assess biological importance. Three of the criteria relate to habitat block and five criteria assess the biological value of the potential linkage zone. Weights are assigned to individual biological values to emphasize their contribution to the overall ecosystem process and habitat quality.
- Threats refer to the known or perceived threats to the linkage caused by current or potential habitat alteration, which may include highway construction.
- Opportunities are defined as active efforts to acquire land within a potential linkage zone or the presence of key landowners that are willing to collaborate on conservation. Numerical scores of the threats and opportunities were computed based upon consistent, defined values which also included weighted values reflecting the threat to connectivity and permeability.
- Potential linkages are also assigned points reflecting continuity (of bordering states or Mexico) and inclusion in ADOT's five-year and twenty-year plans.

The ultimate result is a connectivity process wherein wildlife linkages are consistently integrated into ADOT's planning process for future projects. This connectivity process has been carried forward when discussing location and type of wildlife features. The use of a graphic rating could be considered for MDT's WAP.

MDT Relevancy:

- ADOT defined a process to consistently rate biological values which highlight critical wildlife linkages. ADOT can then use these linkages to focus or prioritize wildlife accommodations or treatments into highway projects that have the highest risk or greatest potential benefit to wildlife.
- After review, it was determined that the rating tool is dated and does not appear to fit into MDT's current project delivery system without additional research effort and process integration. Although extensive and informative, this prioritization tool is not recommended for MDT inclusion into the WAP development. It may be representative of an effort MDT considers undertaking in the future.

2.2.2 California

California Department of Transportation (Caltrans) has developed a literature-based guide to identify and assess wildlife crossings and best practices (Meese, 2009). The manual is intended primarily for biologists, but planners and engineers may also find it useful. Although this document focuses on wildlife crossings, key takeaways for MDT's process include:

- Recognition that the best time to consider wildlife crossing issues is during initial project planning but a formal decision tree process was also developed to recognize the flexibility for decisions at later project stages.
- Adaptive Management is necessary to effectively improve the traveling public safety, to reduce effects on listed species and to enhance wildlife crossing. Adaptive Management can be planned for by specifically recommending assessment of the action and response to situations where the original actions did not provide the desired intent and were subsequently modified.

Figure 2-3 captures the overview of the multiple phases where wildlife crossing decisions can be accommodated. The actual decision trees provide multiple decision points, loops and cross checks. This process implies significant efforts to capture baseline data and also to allow flexibility within project scope.

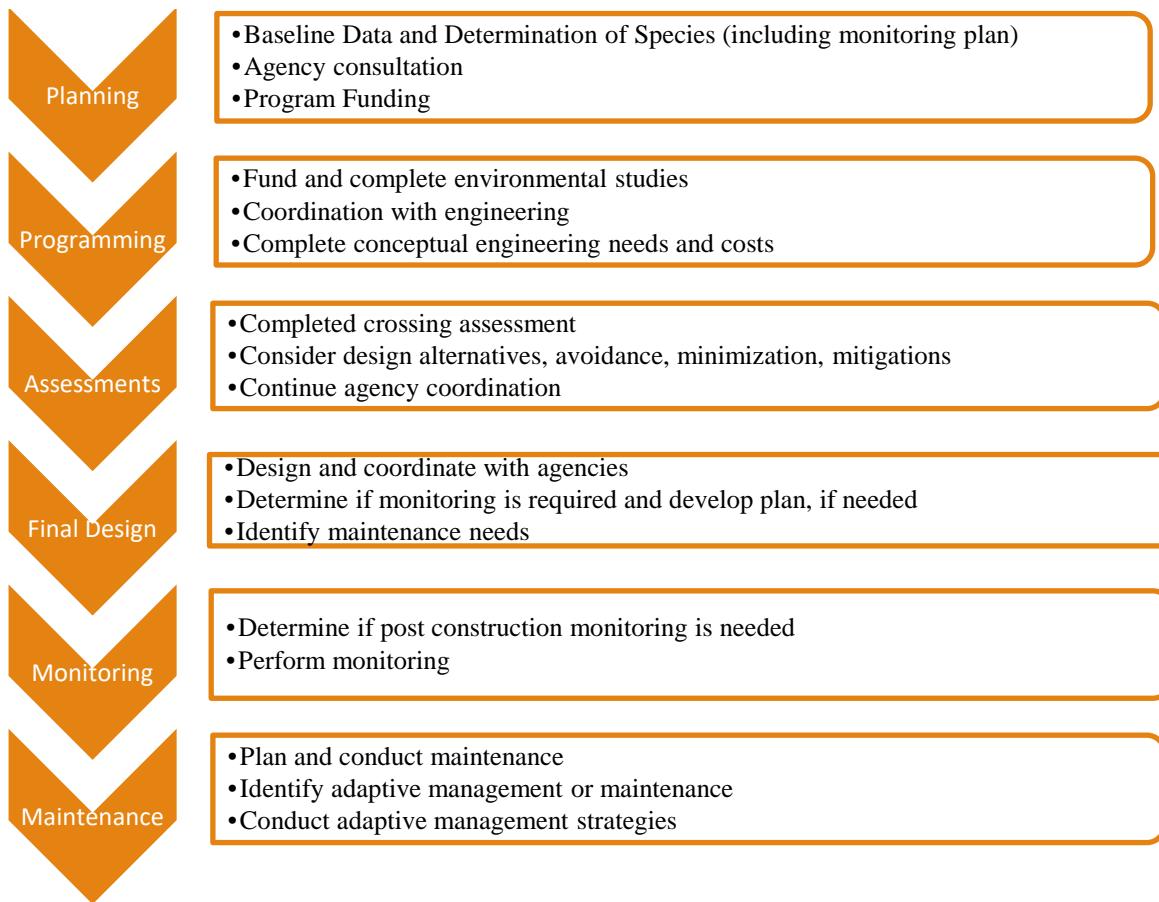


Figure 2-3: Synopsis of Caltrans Decision Tree Phases for Wildlife Crossings

MDT Relevancy:

- Caltrans has very detailed guidance solely for wildlife crossings; beginning before project nomination to maintenance and monitoring after construction. The level of detail requires extensive staffing to develop initial, baseline data and then to interactively implement for individual projects. Portions representing the interaction between wildlife science and engineering provide a possible example for MDT efforts.
- After review, it was determined that the Caltrans guidance is primarily focused on wildlife crossings and too labor-intensive to be viable in Montana, given the current budget constraints and resource allocations. However, certain steps shown in Figure 2-3 could be forwarded as example steps in development of MDT's WAP. Items within Caltrans' guidance may be relevant for adaptive management processes for MDT consideration.

2.2.3 Idaho

Idaho Department of Transportation (ITD) developed the Idaho Wildlife Vehicle Collision (WVC) Prioritization Process (Cramer, 2014), a research-based methodology to better understand areas in which wildlife problem areas occur and to prioritize appropriate mitigation. Although the Idaho process summarized below is focused upon WVC projects only, elements may be considered for incorporation into MDT's process for standard projects.

Idaho's WVC Prioritization Process, shown in Table 2-4, directed users through a series of thirteen steps that involved gathering data and obtained consensus among ITD and Idaho Department of Fish and Game (IDFG) and prioritized the wildlife-vehicle process. Furthermore, these thirteen steps were used to create matrices relating to transportation planning and priority ranking of road segments.

Table 2-4: ITD Wildlife-Vehicle Prioritization Process

Step and Information Source	Evaluate	Maximum Score for This Step
Step 1. GIS Analysis	Safety GIS Layer Total Maximum Points = 50 Idaho 2007 Wildlife Linkages Maximum Points = 30 Wildlife Habitat Maps Maximum Points = 20 Total Combined GIS Map Points (50 + 30+20)	100
Step 2. ITD-IDFG Needs Assessment	ITD Districts work with IDFG to prioritize areas based on ecology not represented in Step 1.	15
Step 3. State Objectives of the Proposed Actions	Clearly state objectives and performance measures of action.	No Points
Step 4. Land Ownership	Evaluate land ownership in the area for feasibility of creating mitigation with protected lands.	5
Step 5. Evaluate Future Transportation Projects	Evaluate area in relation to projects listed in Long Range, STIP, Corridor Plans, and Projects. Look for potential opportunities to incorporate WVC mitigation actions.	5
Step 6. Look for Retrofit of Existing Structures	Analyze existing infrastructure for retrofits opportunities.	5
Step 7. Field Visit	Build Consensus with public and private partners while visiting potential mitigation sites.	No points
Step 8. Select Mitigation Type & Specifics	Choose mitigation in short-term and long-term based on WVC problem and possible solutions	No Points
Step 9. Conduct Benefit-Cost Analysis	Evaluate how cost-effective the mitigation is projected to be over life of infrastructure.	5
Step 10. Identify Potential Funding Partners	Work at district and state level to find public and private mitigation funding.	No points
Step 11. Establish Performance Measures, State Constraints, Estimate Likelihood of Success	Define safety and ecological standards for success, estimate time, cost, cooperation constraints, potential for success.	No points
Step 12. Annually Select District & State Priorities	ITD Districts select annual priority WVC priority segments for mitigation, Committee selects state priorities.	No points
Step 13. Announce State and District Level Priorities, Begin Mitigation Actions	Regular annual event where ITD-IDFG jointly issue press release on top projects to be constructed, and work schedules for completing projects.	No points
Total Points	135	

MDT Relevancy:

- ITD developed a detailed, numerical rating process for prioritization of wildlife vehicle crash areas that may fit within MDT's early project development stages. Further conversations with ITD staff indicated the guidance has had limited

implementation in project delivery. Similar to Montana, this could be attributed to its limited funding levels.

- After review, it was determined that the ITD guidance has many elements that could be forwarded for consideration in development of MDT's WAP. These steps include:
 - Consider developing a systematic, numerical formula for prioritization.
 - A comprehensive GIS database that is both standalone and compatible with IPLAN (an ITD collaborative information portal available on the internet that allows ITD personnel and stakeholders to obtain geospatial data that assists in planning) to identify and help prioritize areas for WVC on Idaho's state roads.
 - A wildlife passage assessment system is defined to evaluate existing infrastructure for potential retrofits and modifications to allow greater permeability for wildlife species to pass beneath the road.

2.2.4 Maine

Maine Department of Transportation (MaineDOT) in cooperation with ten federal and state agencies developed a Waterway and Wildlife Crossing Policy and Design Guide (MaineDOT, 2008). This Policy and Design Guide focused on balancing the interrelated needs of the site when examining whether aquatic organism, wildlife habitat, or hydrologic connectivity are compatible with new stream crossing structures, improvements to existing structures or location of new roadways. Although this document is primarily related to aquatic organisms, there are unique parts of this effort that may be considered for MDT's process including:

- This effort developed a policy which was signed by multiple officers of MaineDOT and an elected official.
- The policy:
 - Defines clear goals (See Appendix A - 1)
 - Originates from an interagency group
 - Documents the applicability and usage of the guidance document.

MDT Relevancy:

- MaineDOT has developed a multi-agency process for waterway and wildlife crossings.

- After review, it was determined that the majority of MaineDOT's policy does not appear to fit into MDT's current project delivery system as its focus was primarily on aquatic crossings. Very little policy was directed toward terrestrial accommodation, a primary MDT issue.

2.2.5 Massachusetts

Chapter 14 of Massachusetts's Highway Manual addresses wildlife accommodations (Massachusetts Department of Transportation (MassDOT), 2006). Figure 2-4 displays the decision tree for including wildlife accommodations.

The document stated that MassDOT's efforts to accommodate wildlife will be primarily:

- Applied on reconstruction of existing roads and bridges.
- Focused on rare species that require conservation instead of more ubiquitous wildlife such as deer.
- Prioritized to connect areas of high-value habitat (and noted that areas not providing habitat on both sides of a roadway should not be included).
- Considered where high crash statistics indicate a problem exists for wildlife.
- Focused on providing for bridge or culvert passage for aquatic animals and allowing fish passage.

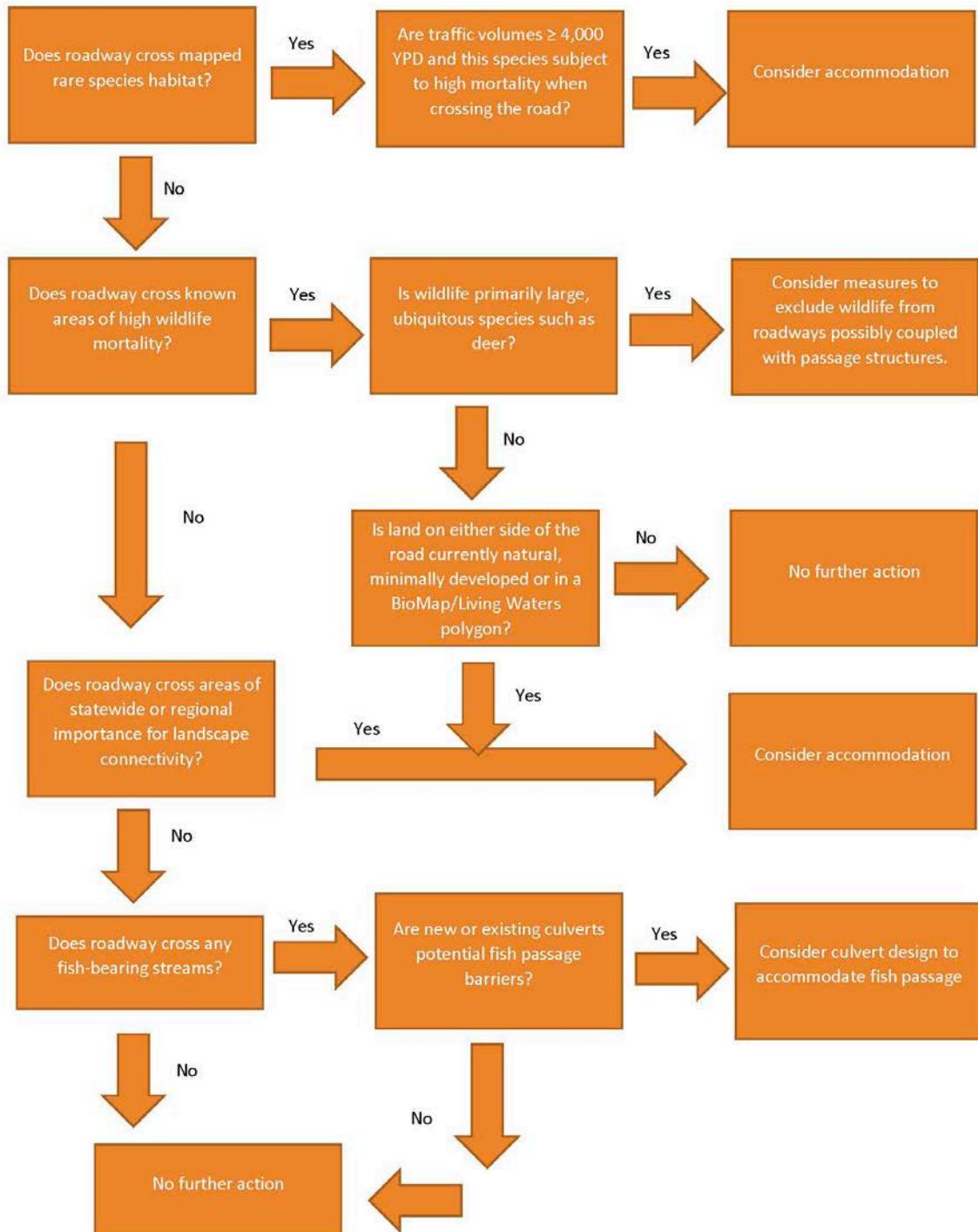


Figure 2-4: MassDOT Wildlife Accommodation Requirement Scenario

Figure 2-5 shows the initiatives MassDOT defined for consideration as goals and guidelines when addressing wildlife issues. These initiatives include standard design considerations but also address traffic classifications and vehicular materials.

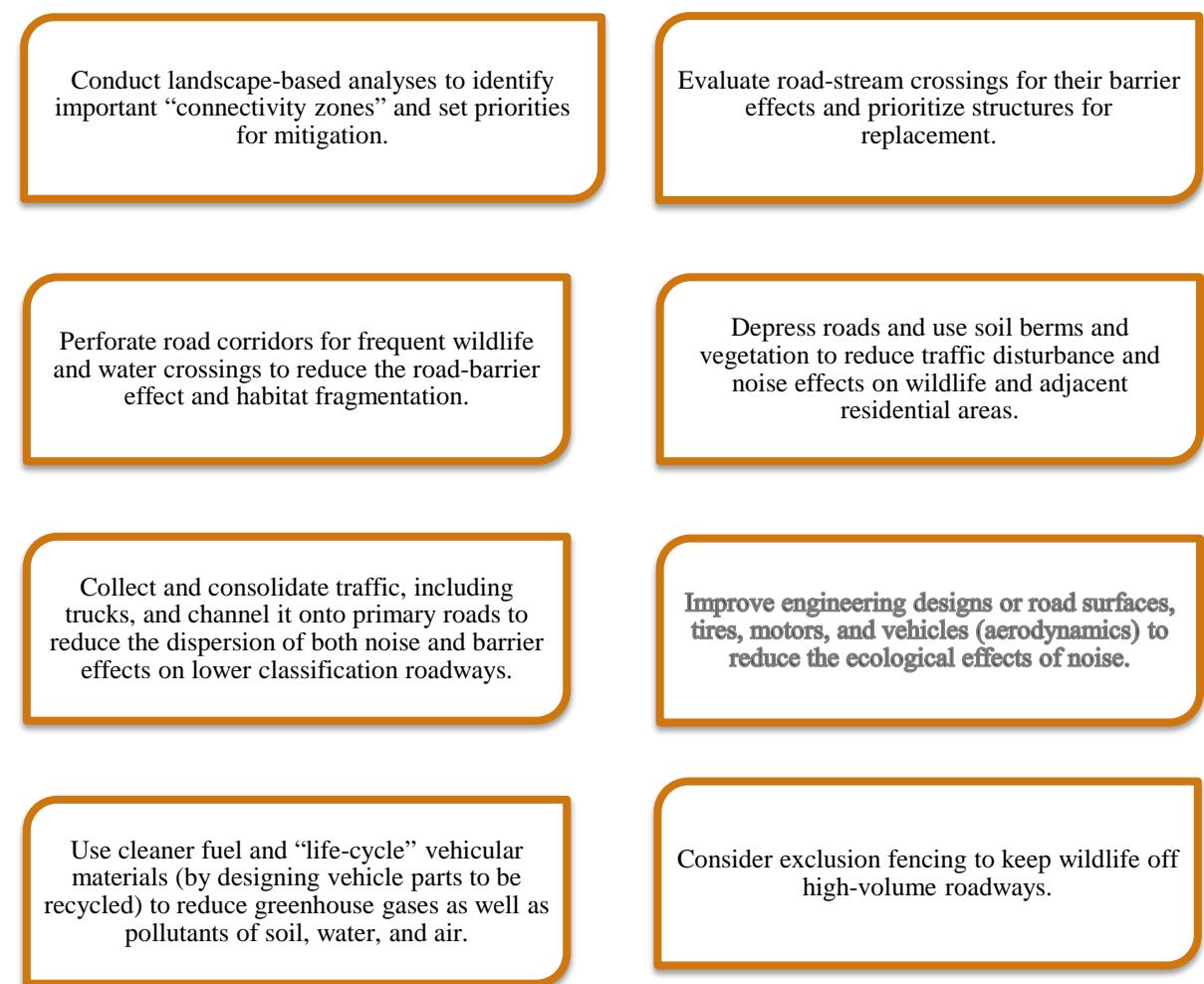


Figure 2-5: MassDOT Wildlife Initiatives Goals and Guidelines

MassDOT offered three takeaways for consideration:

- The decision tree for wildlife accommodations, shown in Figure 2-4
- Itemizing specific categories for wildlife accommodation effects such as wildlife-vehicle collisions, habitat loss, habitat fragmentation, and altered habitat quality.
- Developing initiatives which serve as goals and guidelines as denoted in Figure 2-5.

MDT Relevancy:

- MassDOT included a separate wildlife chapter in their Highway Manual with a strong focus toward existing roads and bridge treatments. The chapter offers some formats for future consideration.
- After review, it was determined that the MassDOT's decision tree and initiatives framework could be modified for consideration in development of MDT's WAP.

2.2.6 Utah

The Utah Department of Transportation (UDOT) has developed two guidance documents addressing wildlife crossings and animal-vehicle collisions. One document is a research effort analyzing crossing efficiency and developing recommendations at existing culverts and bridges (Cramer, 2012). This extensive research effort focused on the treatments and is not summarized below but is included in Appendix A - 1. UDOT also retained Wildlife QIT, a research organization, to prepare the Wildlife and Domestic Animal-Vehicle Collisions toolkit for UDOT (Wildlife QIT, 2005).

The toolkit provided a wide variety of data and direction, which are summarized in Figure 2-6.

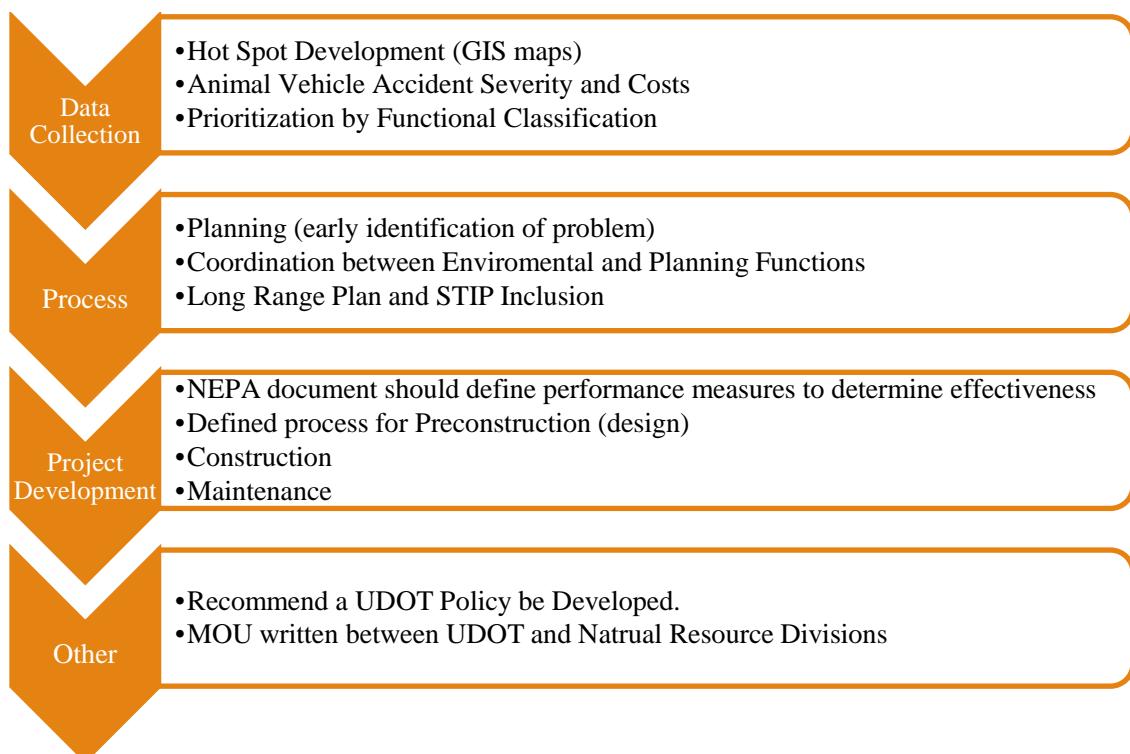


Figure 2-6: Synopsis of UDOT Wildlife QIT Toolkit

MDT Relevancy:

- UDOT developed two guidance documents; one focused on research on efficiency of wildlife crossings and the other developed a toolkit.
- After review, it was determined that the research effort is not applicable to MDT's WAP process as it primarily focused on wildlife crossing usage in different corridors throughout the state.
- The toolkit has elements that may be applicable to development of MDT's WAP. Elements that may be considered include:
 - A defined data collection process
 - A process that includes Planning and Programming
 - A process with defined project development
 - A recommendation to develop a memorandum of agreement between the Transportation and Natural Resource Departments.

2.2.7 Vermont

Vermont Agency of Transportation (VTrans) has developed a Transportation and Habitat Connectivity Guidance Document (VTrans, 2012). This guidance was designed to provide best-management-practices addressing wildlife vehicle conflicts and habitat connectivity. It is broken into three main sections: planning, design and construction, and operations and maintenance. The sections describe steps and procedures, and specific examples of how to address challenges associated with ecosystems, wildlife, and transportation focusing on step-by-step processes and checklists relevant to planning and managing roadways for increased habitat connectivity.

VTrans utilized a 5-step planning approach, as depicted in Figure 2-7, to accurately assess the current status of wildlife movement, develop measurement and modeling tools, apply cost-benefit analyses, and implementation of adaptive solutions.

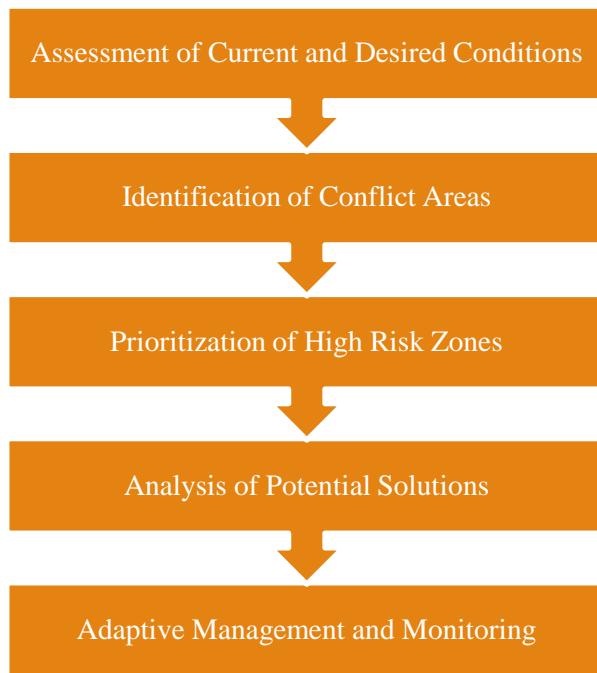


Figure 2-7: VTrans Five-Step Approach for Wildlife

The design and construction section of the report included discussions relating to the enhancement of existing structures, use of wildlife specific structures and right-of-way access control structures.

Finally, the operations and maintenance section highlighted driver based solutions and inventories utilizing the Wildlife Infrastructure Enhancements Recording System (WIERS). WIERS will serve as a communication tool with maintenance personnel and/or contractors to protect new wildlife-orientated changes and enhancements for perpetuity.

MDT Relevancy:

- Vermont's connectivity guidance provided direction for all phases of MDT project delivery with a process framework, procedures and examples for addressing challenges associated with ecosystems, wildlife and transportation. The usage of a system such as WIERS may be beneficial as a future post-construction monitoring and a data sharing tool.

CHAPTER 3

INTERVIEWS

Interviews were held between June and September 2016 to obtain insight on incorporating wildlife accommodations into MDT projects and identification of areas for improvement in current MDT efforts. The individual interviews were identified as persons that met one or more of the following criterion:

- Specialist in wildlife science and have highway interaction
- Designer involved with district or statewide projects
- Responsible for project delivery at the statewide and district levels
- Responsible for maintenance at the statewide and district levels
- Involved in construction at the statewide and district levels
- Government agency responsible for managing public lands that works with MDT in delivering and managing projects
- Government agency responsible for managing wildlife resources in Montana (that works with MDT in delivering and managing projects)

The interviews focused on identifying existing roles, interaction and communication gaps; defining preferred timing of communications; offering which individuals or specialists need to communicate and possible tools for communication. Table 3-1 summarizes the interviews conducted with minutes included in Appendix B.

Table 3-1: Summary of Interviews

Agency	Department or District	Name	Previous Wildlife Accommodations Experience?	Date
MDT Management	Glendive District	Shane Mintz	Yes	08-04-2016
	Missoula District	Ed Toavs Shane Stack	Yes	06-09-2016
	Great Falls District	Dave Hand Steve Prinzing	Yes	06-29-2016
	Billings District	Gary Neville	No	08-19-2016
	Management	Dustin Rouse	No	07-15-2016
	Management	Dwane Kailey	Yes	07-14-2016
MDT Environmental	Environmental Management	Tom Martin	Yes	07-15-2016

Agency	Department or District	Name	Previous Wildlife Accommodations Experience?	Date
	Environmental Management	Bill Semmens	Yes	07-13-2016
	Biologist Butte District	Deb Wambach	Yes	07-05-2016
	Biologist Billings District	Susan Lenard	Yes	08-24-2016
	Biologist Glendive District	Larry Sickerson	Yes	08-25-2016
	Biologist Missoula District	Joe Weigand	Yes	08-26-2016
	Biologist Great Falls District	Paul Sturm	Yes	08-31-2016
MDT Design	Bridge Design	Kent Barnes	Yes	07-06-2016
		Chris Hardan Nathan Haddick	Yes	08-24-2016
	Highway Design	Lesly Tribelhorn	Yes	07-15-2016
		Jim Combs	No	08-18-2016
		Jennifer Nelson	Yes	07-01-2016
		RJ Snyder	Yes	09-02-2016
		Bill Squires	Yes	09-09-2016
	Consultant Design	Bryan Miller	Yes	08-02-2016
	Hydraulics	David Hedstrom	Yes	08-04-2016
MDT Other Functional Areas	Traffic Safety	Kraig McLeod	No	08-04-2016
	Construction	Kevin Christensen	Yes	08-24-2016
		Matt Collingwood	No	07-07-2016
	Maintenance	Doug McBroom	No	07-08-2016
	Geotechnical	Scott Helm	Yes	08-18-2016
	Planning	Carol Strizich Charity Watt	No	08-18-2016
		Rob Stapley	No	08-23-2016
Federal, Tribal or State Agencies				
CSKT	Biologist	Dale Becker Whisper Means	Yes	06-09-2016
FHWA	ROW and Environmental	Brian Hasselbach Gene Kaufman Marcee Allen	Yes	07-06-2016
USFWS	Wildlife	Mike McGrath	Yes	08-08-2016
USFS	National Carnivore Program, Wildlife Program Leader	Scott Jackson Michele Fletcher	Yes	08-22-2016



Agency	Department or District	Name	Previous Wildlife Accommodations Experience?	Date
FWP	Area Biologist Kalispell	Jessy Coltrane	Yes	08-17-2016
FWP	Wildlife Bureau Coordinator	Quentin Kujala	No	08-25-2016
FWP	Area Biologist Butte	Vanna Boccadori	Yes	09-21-2016
GNP	Glacier National Park Wildlife Biologist	John Waller	Yes	08-02-2016

3.1 MDT Interview Findings

The sections below summarize the overview from combined interviews with staff in MDT units and functional areas.

3.1.1 Management

- MDT Biologists have adequate knowledge and can be considered their district's wildlife knowledge source.
- MDT culture has made progress toward incorporating wildlife issues but work is still needed.
- MDT needs an iterative design process.
- Planning stages, including Other (OT) or corridor studies, should identify if there is a wildlife habitat connectivity or public safety issue and indicate future considerations if applicable. Ideally, this should occur before a project nomination; so that budgets are identified and programmed.
- Wildlife accommodations (WA) need to be identified early and scoped before going to design, whether internal or consultant designed project.
- Justification of WA:
 - Should address Operations and Maintenance as this becomes a long-term responsibility for MDT and needs to be reflected in areas beyond pre-construction.
 - Needs a defendable justification for inclusion or exclusion of WA based upon a balance of road design standards and wildlife science.

- Could consider including the value of wildlife on a per animal basis or based upon the value that wildlife brings to the local economy and lifestyle.
- Consider WA guidelines rather than policy.

3.1.2 Environmental

- Need a WA decision activity or mechanism based upon wildlife needs. The decision could be documented in existing milestone documents and should address feasibility and reasonableness.
- Subsequent WA design should be iterative, team decision.
- Designers need to respect and consider wildlife evaluations and recommendations, such as documented in the Biological Resources Report (BRR). This input should be incorporated into the project.
- Biologist could provide wildlife considerations to District Administrator (DA) at project nomination, if requested.
- Corridor studies should identify wildlife needs and considerations.
- A change in MDT culture with respect to wildlife considerations needs to occur. Wildlife science data is not accepted by some MDT staff.
- Education of regulatory and resource agencies is needed to understand MDT's overall mission and design criteria. Consistent documentation and discussion with agencies needs to occur for each project. MDT Environmental staff can build understanding and trust with Resource Agency (RA) staff if explanations for project decisions and changes are provided to RA.
- Carcass data is not vetted for accuracy or consistency. Prefer utilizing global-positioning-software (GPS) or other electronic devices to improve precision.
- Recommendations for WA are needed by Alignment and Grade Review (AGR).
- Need separate activity in MDT's flowcharts for justification of WA.

3.1.3 Biologists

- An MDT culture change is needed to fully incorporate environmental stewardship into design. Support needs to trickle downward from the highest levels within MDT. Trust and respect is needed within the design team.
- Need consistent documentation and discussion with RA.

- Need wildlife consideration and involvement early in the project, preferably at project nomination or STIP. Corridor studies should also address wildlife issues, and possibly, accommodations.
- BRR typically identifies wildlife and issues due to the proposed project. Cost of WA and alignment impacts are not included until later in the project development (often AGR or later). As a result, wildlife concerns then become an increased or add-on cost and are not considered an integral project cost.
- Documentation of wildlife accommodations does not occur consistently. WA could be a required section in milestone documents.
- Maintenance staff should be consulted for their hard-earned knowledge of the roadside terrain.
- Need recognition by MDT staff that roads influence wildlife in ways which are not reflected in crash and carcass records. WA decisions need to balance design with environmental stewardship.
- Justification of accommodations can include construction costs but should also reflect wildlife loss, impacts costs and wildlife conservation. As these justifications are primarily soft values and not data-based numbers, consideration is needed as to how information fits within MDT's data-driven decision process.
- Consider if a separate funding source be developed for wildlife accommodations as a fixed amount or a statewide program.

3.1.4 Design

Bridge

- Engineering culture needs to shift to accommodate wildlife within infrastructure.
- Fluidity of WA design standards is challenging to incorporate into MDT's engineering process. Minimums standards will need to be set to ensure no fluctuation.
- Need education between engineers and scientists.
- Design decisions can be fluid and currently occur throughout the Survey phase. WA decisions can occur after AGR.
- Need decision document or inclusion in current milestone report.

- Wildlife accommodation decisions need to be made by the District and absorbed within their budgets.
- Presently, projects are morphing such that bridge openings are being defined by environmental issues and not hydraulics or grade requirements.
- Incorporate entire design team into decisions for wildlife inclusion.
- Guidance may be preferable to design standards.

Road Design

- Justification by biologist of crash data and wildlife data around PFR allows for easier inclusion into a project. Advanced data collection, utilizing equipment such as cameras, can be strategically planned to gather supporting data with no additional costs to the project.
- Design could be easier if the justification and need of the accommodation is provided from environmental. Timing could be later than AGR but preferably before.
- Staff acknowledge that crash data is underreported and wonder if this data gap could be used in WA justification.
- Maintenance staff of all levels have added and suggested crossings based upon their “boots-on-the-ground” knowledge.
- Construction staff involvement is needed to review constructability at or before AGR.
- WA decisions are desirable at AGR or, at a minimum, before right-of-way limits are set. Consider a pre-AGR or Design Concept Review meeting to present preliminary grade to functional units for comprehensive discussion and design iteration.
- Prefer wildlife needs are discussed at the project nomination stage and carried throughout design lifecycle.
- Consider the Engineering Services Supervisor (ESS) checking with biologists for wildlife needs as part of the 950 Nomination Activity.
- Need quick access to wildlife data at nomination time.
- Need accurate, timely and accountable information.

- Biologist should attend and participate in PFR.
- Project Managers should seek out biologist and wildlife experts for input at early project stages. MDT culture needs to incorporate science and environmental services into the project design team to create a collaborative and comprehensive product.
- Project Team needs to have confidence in wildlife recommendations and utilize MDT staff expertise. A map tool that defines wildlife intensity corridors would be helpful during project development.
- Environmental staff need to provide a defensible justification highlighting the present wildlife corridor needs and associated project impacts. Justification should also address competing resources, such as funding, wetland, or other terrestrial benefits, and project trade-offs.
- Justification needs to:
 - Address if land uses are sustainable or likely to change.
 - Be solid enough to use in design exception justification.
 - Apply performance based and practical design.
 - Document reasonable WA maximum that balance with overall project.
 - Include applicable research documents.
 - Include maintenance costs.
 - Address utility and R/W costs.
- A design team should include engineers and biologists.
- OT projects or corridor studies should identify wildlife needs, if they exist.
- Suggest Resource Agency (RA) input and buy-in at AGR stage. Consider how RA's could offer concurrence or support of general concept before final plans (to avoid re-work with later RA input).
- Define WA measurable benefits or predictable benefits to meet MDT's goal of Performance-Based Design.
- Consider developing a map-based tool for wildlife intensity /heat maps or permeability maps.

- OT and Planning projects should address wildlife. These studies may be too broad for wildlife accommodation justification. Suggest reviewing MDT's scoping of these studies for wildlife issues.
- Consider a tool for MDT to include other funding sources for WA.
- Consider a state-wide pool or funding program for wildlife resources as. Environmental currently has no monetary balance for wildlife project impacts.
- Wildlife accommodations needs should be documented similar to the hydraulics justification of bridge opening/Initial Recommendation Memo. Timing should be shortly after PFR or early stages. Wildlife accommodations options and recommendations should be documented similar to the Type, Size and Location (TSL) report. This decision document can allow for future revisions, similar to wetland delineations updates.
- Need to consider future land use while analyzing for wildlife accommodations.
- Wildlife Data needs to incorporate better wildlife corridor and movement justification. Additionally, MDT needs to share project information jointly with RA's.
- MDT will need to accept less, statistically-valid data for wildlife.
- Need to apply performance-based and practical design techniques for WA.
- Need education and collaboration between road design engineers and scientists to accept thorough, but not data-driven justification.
- Need design standards for wildlife accommodations or at least wildlife thresholds.

Hydraulics

- Wildlife accommodation decision needed between PFR and AGR.
- Justification for WA needs to clearly define need and feasibility.
- Education in field between designer and scientist is helpful.
- WA design standards would be beneficial. When wildlife openings continually change without a clear justification, it is discouraging and does not build trust.
- Consider MDT activity 370 or 356 as possible activities for wildlife accommodations.

3.1.5 District Administrator (DA)

- A wildlife accommodation justification and decision process is needed.
- Biologist should attend the PFR and be prepared to summarize wildlife issues. The PFR agenda should include a task item for wildlife discussions.
- Baseline data of wildlife movement is needed.
- Carcass and crash data is incomplete and has gaps in data. E.g., small wildlife data is not collected at all.
- Design guidance is needed for under crossings or, at a minimum, consistency is needed for determining opening size.
- Consider existing and future land use at crossing locations in the decision process.
- Consider guidance for exclusionary fencing limits beyond wildlife crossing structures.
- Consider that wildlife fencing creates additional maintenance responsibility for MDT due to litter and ownership disputes.
- Exclusionary wildlife fencing termini can become a new potential conflict concentration for wildlife.
- Consider if un-mowed ditches are a wildlife attraction which create a hazard for both small and large animals.

3.1.6 Construction

- Construction management should be invited to PFR.
- Need a discussion of wildlife issues during PFR. Staff should come prepared with investigation and research already done.
- Milestone reports are needed for justification of accommodations and should include any compromises and final design decisions as well as highlight the comprehensive involvement by all functional areas. If wildlife accommodation conflicts cannot be resolved, then the decision should be taken to a higher level.
- Identification and justification of accommodations is needed, along with design flexibility.

- Wildlife accommodations that place restrictions on construction timing, sequencing, locations, etc. have a significant impact.
- Specials and designs added at late stages of project development have rippling effects. Wildlife impacts need to be integrated into the overall design, not dropped in at the last minute with no oversight or coordination and should not affect project delivery and budget. Design specials and associated details should be final at final design submittal/review meeting.
- Education needs to occur between environmental and construction.
- Wildlife-friendly-fencing is negotiated in right-of-way acquisition which is not until late stages of project. Acquisition may not coordinate with design.
- Future land use should be addressed in wildlife mobility features. Consider if wildlife easement might be developed.

3.1.7 Maintenance:

- Involve maintenance early in design decisions stages, preferably PFR.
- Consistent design and standard materials allow for more-efficient maintenance.
- Carcass collection is not collected with GPS.
- Wildlife accommodations require future maintenance effort and funds and should be considered during project planning.

3.1.8 Planning:

- Document the need and feasibility to ensure the justification meets the balance between wildlife needs, funding, design and safety with underlying politics.
- Corridor studies are a tool to capture presence and wildlife concerns.
- Designers and others need to recognize crashes are under-represented.
- The statewide policy, Tranplan, is being updated.

3.1.9 Geotechnical:

- Define the need and present all options. Include cost in any justifications.
- Consider developing a “heat map” to show GIS layers at hot areas (areas with high needs or sensitivity).

- Discuss wildlife needs at PFR. Biologist should discuss possible crossing needs and locations. Coordinate early geotechnical investigations if future structure could be included.
- Need a baseline to compare data.
- Consider education of regulatory agencies to understand DOT funding, goals, mission, etc.
- Incorporate an iterative design process that provides engineers and biologists with a better understanding each other's functional design challenges.

3.1.10 Right-of-Way

- Vision Zero can only be achieved when the effects outside the roadway and roadside are recognized.
- Currently working on removal of old stockpasses due to changes in land uses and ranching operations. Consider if stockpass removal will affect wildlife.

3.1.11 Consultant Design

- Design decisions can be fluid. Currently wildlife needs are addressed throughout Survey Phase and sometimes after AGR. Ideally, wildlife accommodations should be discussed at the project scoping phase (nomination and PFR).
- BRR should identify wildlife needs, vehicle safety, the value to removing obstacles for wildlife, land use and ownership.
- Decision documents should be iterative and clearly define needs and provide justification. Justifications need to be able to support design expectations, including value, for both vehicle safety and wildlife, and should consider land ownership.
- Upper management support and leadership is needed.

3.1.12 Traffic Safety

- Consider if MDT could use federal funds to purchase a “right” to protect future wildlife usage.
- Safety analysis should be presented at PFR to advance discussions.
- Justification for wildlife accommodations should be data driven, economically justified and objective.

3.2 Resource Agency Interview Findings

3.2.1 Federal Highway Administration (FHWA)

- MDT Environmental Activity (722 or 126) is too late for accommodating wildlife into design. Need at earlier, planning activities.
- Wildlife monitoring could possibly be eligible for federal funds, after a project is constructed, similar to the wetland monitoring program.
- Justification for wildlife features is needed. If justification for wildlife is not adequate, federally-required Value Engineering (VE) practices may recommend removing accommodations to provide better value to traveling public. Currently the value of wildlife impacts is not accounted for in current cost-to-benefit (c/b) or cost ratios.
- Planning studies should include RA outreach to seek wildlife accommodation input at early planning stages.

3.2.2 Fish, Wildlife and Parks (FWP)

- Crucial Area Planning System (CAPS) tool provides wildlife information and is available from the department website.
- Additional wildlife data may be provided from FWP for specific project needs.
- Consider potential opportunity for collaboratively data collection and research with FWP and MDT.
- Wildlife accommodations should include roadside treatments, such as clearing/grubbing, landscaping and seeding.
- MDT should engage FWP specialists (typically biologists but others as needed) to educate RA staff in understanding MDT's needs. Recognize that FWP specialists have other missions than road/vehicle/wildlife interaction.
- FWP recognizes that an MDT action may create and catalyze an FWP action. Communication of future projects, including maintenance activities, may result in less of an impact.
- FWP supports inter-agency meetings for communication.
- FWP Director's office manages the Responsive Management Unit (RMU). The RMU may be a communication tool if road blocks appear.

3.2.3 US Forest Service (USFS)

- Tammy Fletcher, Regional Wildlife Program Leader, suggested all MDT contact go through her and she will direct MDT to appropriate staff.
- USFS requests early and frequent contact for projects in vicinity of USFS lands, not just when a project has a direct impact to USFS lands.

3.2.4 US Fish Wildlife Service (USFWS)

- Use FHWA 2011 Wildlife Crossing Structure Handbook for design.
- Seek agency input at STIP and utilize Tranplan for public outreach efforts.

3.2.5 Confederated Salish and Kootenai Tribes (CSKT) (Biologist)

- Need to develop an interactive relationship between engineers and biologists, where input from both is incorporated into project design.
- There are numerous benefits from tribal consultation through all project stages.
- Policy agreement at the highest level sets the stage for projects.
- Previous education efforts, such as road ecology class, MDT rotation of engineers, etc., provided broader exposure.

3.2.6 Glacier National Park (GNP)

A telephone interview was held with no specific highlights.

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APPENDIX A – 1: OVERVIEW OF PEER STATE WILDLIFE LITERATURE SEARCH



Appendix A -1 provides a summary of the research team's investigation of peer states with wildlife policy, guidance, or research, suitable for consideration in developing MDT's WAP. As there are no uniform standards, wildlife accommodation data was searched for all fifty states using the key terms: wildlife crossing, wildlife process, wildlife accommodation and wildlife-vehicle mitigation. The results of this query provided insights from seven states, which are addressed in the full report, as well as nine states deemed not applicable for developing Montana's approach and strategies. The states included in this appendix are summarized in Table A-1.

Table A-1: Summary of Peer States

State	Wildlife Documents Related to:				Forwarded for Further Consideration
	Process	Design Policy, Guidance, or Standard	Research and Monitoring	Connectivity or Linkage Study	
Arizona	X	X	X	X	Yes
California	X	X			Yes
Colorado			X		No
Florida		X			No
Idaho	X		X	X	Yes
Maine	X	X			Yes
Massachusetts	X	X			Yes
New Mexico			X		No
Oregon			X	X	No
Pennsylvania		X			No
Texas			X		No
Utah	X		X		Yes
Vermont	X	X	X		Yes
Virginia			X		No
Washington			X	X – Pending	No
Wyoming			X		No

The following pages overview individual documents by state and summarize the goals, outline, and observations found unique or worthy of future consideration in developing Montana's wildlife accommodations process (WAP). For states with potential MDT relevancy, the full report summarizes features applicable for consideration in development of the accommodations process which is not repeated in the appendix. For states with documents that were not carried forward, this appendix summarizes comments from the review and the reason the document was not considered applicable for Montana.

The WAP project focuses on the project delivery processes; therefore, documents that are design standards, research or monitoring efforts are not considered relevant.



ARIZONA

The Arizona Department of Transportation (ADOT) has developed several environmental and technical guidance documents relating to wildlife connectivity. These documents include a wildlife linkages assessment, wildlife connectivity guidance, wildlife escape measures with engineered drawings and wildlife funnel fencing with engineered drawings. The wildlife connectivity guidance (ADOT, Undated) and wildlife linkages (Nordhaugen, 2006) are outlined below. The wildlife escape and funnel fencing are considered design documents and are not forwarded for further consideration.

Wildlife Linkages Assessment

Arizona's wildlife linkages assessment created linkage designs for 16 priority areas based upon a large, interagency effort. These assessments identified large blocks of protected habitat, potential wildlife movement corridors through and between them, the factors that could possibly disrupt these linkage zones and opportunities for conservation. These were layered with transportation and regional planning.

Goals:

- Identify and map areas where connectivity between large blocks of publicly owned wildlife habitat has been, or is, at risk of being severed by human activities
- Ascertain the associated threats to wildlife movement and list the important wildlife species that would be affected by loss of connectivity in each potential linkage zone
- Identify and map existing potential linkage zones within habitat blocks in need of continued protection
- Identify and map important riparian areas that function as a habitat as well as a corridor of connectivity
- Encourage and promote the conservation, retention, and acquisition of land where potential linkage zones exist
- Integrate this information into transportation and regional development planning
- Prioritize the potential linkage zones for refinement

- Encourage the development of a linkage design for each potential linkage zone, that is, a detailed assessment and action plan to conserve or restore a wildlife linkage
- Involve more stakeholders in the process, including tribal nations, engineers, wildland, and urban planners
- Develop an interactive decision support tool, both web-based and stand alone, for use by all resource stakeholders

Outline:

- Arizona's Wildlife Linkages Prioritization
- Arizona's Wildlife Linkages Workgroup and Workshop Overviews
- Mapping of linkage zones including potential linkage zones, riparian habitat, and future directions
- Connectivity related projects
- Contributor's connectivity efforts
- Sources for connectivity resolution

Other Comments:

- Biologists, engineers, planners, and land managers from nine public agencies worked together to identify large blocks of protected habitat, the potential wildlife movement corridors through and between them, the factors that could possibly disrupt these linkage zones and opportunities for conservation. This workgroup has engaged in unprecedented cooperation and facilitated discussions and partnerships to help ensure a unified approach to wildlife linkage conservation and management. This coordination was done, in part, by several workshops.
- This document is discussed further in the report.

Wildlife Connectivity Guidance:

The wildlife connectivity guidance document was a follow-up to the Wildlife Linkages Assessment.

Goals: The wildlife Connectivity guidance did not identify a set goal. Rather it outlined how wildlife highway permeability, and thus connectivity, may be influenced by highway standards, traffic volumes and wildlife species goals in addition to habitat type, season, and others.

Outline:

- Highway impact to connectivity – recognizes the impacts that highways can have on wildlife populations due to increased movement of people, goods, and services.
- Promoting highway permeability – discusses structure and fencing use for wildlife mitigation.
- State Route 260 case study – A case study relating to the installation of wildlife fencing.
- Wildlife connectivity guidance – Focuses on the application of passage structures in promoting permeability, along with funnel fencing that is instrumental to passage structure effectiveness.
- Determining locations for wildlife connectivity measures – Discusses tools and approaches for determining where measures are needed to promote highway permeability and maintain landscape connectivity including the development of the landmark 2006 Arizona's Wildlife Linkages Assessment.

Other Comments:

- This document did not offer process input and therefore was not forwarded for further consideration.

CALIFORNIA

California Department of Transportation (Caltrans) has developed a literature-based guide to identify and assess wildlife crossings and best practices (Meese, 2009).

Goals:

- Identify off-the-shelf analyses and best practices from Caltrans projects literature, experience, and related case-studies
- Catalog sources of information that can help avoid, minimize, or mitigate wildlife impacts
- Provide aid in identifying and assessing effects to wildlife movement
- Describe a systematic process that fits into the existing project delivery and planning process
- Initiate a system that may be used to collect and present Caltrans experiences in addressing wildlife crossing issues

Outline:

- What you need to know - This section presents the knowledge to identify and assess wildlife crossings, including regulatory considerations that affect transportation professionals
- Baseline Assessment – This section establishes pre-construction (or baseline) conditions, including an assessment of wildlife groups, relevant field survey methods, data sources, management considerations, and modeling approaches.
- Project Effect Assessment – This section establishes a procedure to determine whether avoidance, minimization, or compensatory mitigation actions are necessary to facilitate wildlife movement or to meet regulatory requirements and/or public safety goals.
- Selecting Avoidance, Minimization, or Compensatory Mitigation Measures – This section reviews procedures to select the best avoidance, minimization, or compensatory mitigation actions to meet regulatory or public safety requirements, including a review of structures that are most appropriate to facilitate movement by wildlife groups and meet wildlife crossing goals.

- Keeping Informed – This section reviews wildlife crossing resources that are continuously updated to provide new strategies and applications, case studies, symposium proceedings, current literature citations, and additional sources of information relevant to transportation professionals.

Other Comments:

- This document reviews both the scientific and agency literature and uses case studies from within and outside of California to guide efforts to evaluate and avoid, minimize, or compensate for wildlife crossing conflicts.
- This document is a part of a larger Caltrans strategy to 1) catalog sources of information and knowledge of wildlife crossings, 2) generate, accumulate, and disseminate this information, and 3) develop guidelines for best practices and effective strategies to address road/wildlife conflicts.
- This document is discussed further in the report.

COLORADO

The Colorado Wildlife Connectivity report for the Colorado Department of Transportation (CDOT) analyzed animal-vehicle hotspots throughout Colorado from 1986-2004, analyzed mitigation structures in three study areas, and provided underpass monitoring for lynx (Crooks, 2008). A second research effort, CDOT's Highway Corridor Wildlife Mitigation/Habitat Connectivity Research Study Phases II & III: Development of Mitigation Goals and Pre-Construction Data Collection was proposed. No current information was found on the Phase II & III study; so, the remaining section only addresses the Wildlife Connectivity report.

Goals:

- Determine where structural wildlife crossings might be most effectively used on existing highway corridors
- Determine how installation of structural wildlife crossings influence crossing locations, crossing frequencies and animal vehicle collisions along highway corridors where they are installed.

Outline:

- Animal-vehicle collision hotspots
- Wildlife mitigation structures
- Lynx-Roadway Interactions

Other Comments:

- This document did not offer process input and therefore was not forwarded for further consideration.

FLORIDA

Florida Department of Transportation (FDOT) has developed a guideline to determine appropriateness of wildlife crossing features. This guideline also establishes criteria that should be considered during design of wildlife crossings, other structures such as bridges with shelves, and/or exclusionary devices (PRIT, 2016).

Goals:

- Evaluate the appropriateness of including wildlife crossings (upland or wetland), other structures modified for wildlife use, such as bridges with shelves, and/or exclusionary devices (fencing, walls, temporary barriers, etc.) on proposed District projects or on existing roadways as retrofits
- Establish criteria that must be considered during design of wildlife crossing features

Outline:

- Efficient Transportation Decision Making - Efficient Transportation Decision Making (ETDM) is a process where projects are screened and wildlife agency and other stakeholder input is solicited to provide early scoping information regarding potential effects and resources of concern in the project area. During the screening event(s), wildlife agencies and stakeholders have the opportunity to propose wildlife crossing features as well as opportunities for wildlife impact minimization and, if necessary, potential mitigation strategies.
- Project Development and Environment Process - Project Development and Environment (PD&E) is the process by which the FDOT develops the project alternative(s) and analyzes project impacts. It is important for wildlife agencies and stakeholders to be involved during this phase since this is when preliminary design, constructability issues and financial and wildlife agency/stakeholder considerations are balanced to develop the preferred alternative and conceptual design. It is also the phase where commitments are initially considered
- Guidelines for a proposed project on the state highway system (SHS)
- Guidelines for a requested retrofit project on SHS
- List of items to determine whether a wildlife crossing feature is appropriate
- Feature design protocol

Other Comments:

- In developing projects, FDOT District Offices, in coordination with the USFWS and/or Florida Fish and Wildlife Conservation Commission (FWC) identify project development and environment phase as the best opportunity for stakeholder involvement in project planning.
- FDOT identified two phases where early coordination and input are solicited during project planning and development. These concepts were streamlined too closely into FDOT's process for adaption into Montana's process.
- This guidance document was short (four pages) and direct. However, this document did not offer process input that fit Montana and therefore was not forwarded for further consideration

IDAHO

Idaho Department of Transportation (ITD) developed a research-based methodology to better understand areas in which wildlife problem areas occur and prioritize appropriate mitigation (Cramer, 2014).

Goals:

- Create a comprehensive GIS database in collaboration with Idaho Department of Fish and Game (IDFG) that is both standalone and compatible with IPLAN (an ITD web-based application) to identify and prioritize areas for wildlife vehicle crashes (WVC) on Idaho's state roads.
- Develop a methodology that ITD staff, working with IDFG and other groups, can use to identify and prioritize actions to reduce WVC.

Outline:

- Create a Statewide Priorities Map using map modelling
- Work with IDFG and other agencies to form needs assessment prioritization document for ITD districts
- State the objectives of the proposed actions
- Examine landownership maps for feasibility of creating mitigation along protected lands
- Compare the WVC priorities map transportation plans to determine if mitigation can be addressed in upcoming projects or standalone potential projects
- Analyze existing structures for potential retrofits along road segments – office and field visit
- Host a field trip for priority segments
- Select type of wildlife mitigation action
- Prepare a benefit-cost analysis
- Identify potential funding partners

- Establish performance measures, state constraints, and estimate the likelihood of success
- Annually select projects at ITD Districts and State level
- Announce District and State Level priorities, begin mitigation process

Other Comments:

- The WVC Prioritization Process (abbreviation for Statewide WVC Mitigation Actions Prioritization Process) was developed so ITD staff, working with IDFG and other interested parties could identify priority WVC problem road segments, and identify cost-effective feasible actions to reduce WVC in those locations.
- The WVC Prioritization Process was applied in a pilot test to identify high WVC “hotspot” areas in ITD Districts 5 and 6, to recommend actions to reduce WVC in those districts, and to identify parts of the process that were improved. Recommendations as a result of this study included:
 - Organize a standing “Interagency Wildlife Connectivity Committee” to oversee statewide priorities and form similar temporary committees that oversee individual projects.
 - Develop a set of best management practices and guidelines for reducing WVC while promoting wildlife connectivity across or under roads. This would be a more formally developed set of guidelines that would be useful for planning and engineer teams. It would detail where different mitigation actions would be successful, where actions should and should not be used, and the pros and cons of actions.
 - Obtain consistent WVC Carcass Data Collection across the state.
- The WVC Prioritization Process is discussed further in the report.
- ITD maintenance workers collect carcass data on an electronic database. Data includes the time, GPS location or milepost and species. These data are submitted as part timecard entry. Although this information is not relevant for the WAP process, it is a potential technique for tracking carcass data.

MAINE

Maine Department of Transportation (MaineDOT) in cooperation with ten federal and state agencies developed a waterway and wildlife crossing policy and design guide. This guide primarily focuses on aquatic organisms (MaineDOT, 2008)

Goals:

- Locate and design projects to avoid and minimize adverse impacts to wetlands, natural stream channels, wildlife habitats, and other natural resources to the extent practicable and feasible considering cost, existing technology and logistics based on the overall purpose of the project.
- Pass peak stream flows in accordance with MaineDOT's best drainage practices
- Meet applicable regulatory standards and comply with state and federal guidance specific to water quality and aquatic and wildlife migration or movement corridors to the extent practicable
- Mitigate, to the extent practicable, unreasonable adverse impacts to protected natural resources as determined appropriate by regulatory agencies
- Consider potential impacts to private property, utilities, and traffic
- Meet appropriate engineering standards and safety requirements
- Provide reasonable life cycle costs

Outline:

- Policy and Implementation - MaineDOT focused on balancing the interrelated needs of the site when examining whether aquatic organism, wildlife habitat, or hydrologic connectivity are compatible with new stream crossing structures, improvements to existing structures or location of new roadways.
- Habitat and Biological Considerations of Providing Passage – This section identified the following consideration for wildlife passage (some of which may be considered design guidelines):
 - -Physical and Biological Needs for Passage
 - Fish Passage

- Aquatic Organism Passage
- Wildlife Crossings
- Design Guide - This section identified design guidance for wildlife passage:
 - Why Design for Passage?
 - Design Considerations
 - Site-specific Design Measures

Other Comments:

- Although this document focuses on aquatic not terrestrial species, this document is discussed further in the report.

MASSACHUSETTS

Massachusetts Department of Transportation (MassDOT) has developed two guidance documents to provide wildlife accommodations. One addresses wildlife accommodation (MassDOT, 2006) and the second addresses design of bridges and culverts (MassDOT, 2010).

Wildlife Accommodation

The wildlife accommodation guidance addresses the potential effects of roads on wildlife, describes wildlife accommodation that can be incorporated along new and existing roadways, and provides wildlife crossing structure guidelines.

Goals:

- Conduct landscape-based analyses to identify important “connectivity zones” and set priorities for mitigation
- Evaluate road-stream crossings for their barrier effects and prioritize structures for replacement
- Perforate road corridors for frequent wildlife and water crossings to reduce the road-barrier effect and habitat fragmentation
- Depress roads and use soil berms and vegetation to reduce traffic disturbance and noise effects on wildlife and adjacent residential areas
- Collect and consolidate traffic, including trucks, and channel it onto primary roads to reduce the dispersion of both noise and barrier effects on lower classification roadways
- Improve engineering designs or road surfaces, tires, motors, and vehicles (aerodynamics) to reduce the ecological effects of noise
- Use cleaner fuel and “life-cycle” vehicular materials (by designing vehicle parts to be recycled) to reduce greenhouse gases as well as pollutants of soil, water, and air
- Consider exclusion fencing to keep wildlife off high-volume roadways

Outline:

- Types of effects - Wildlife-vehicle collisions, habitat loss and fragmentation, and altered habitat quality.

- Types of wildlife accommodation - Signage, public education and awareness, reduced speed limits, habitat alteration, modified jersey barriers, fencing, and wildlife crossing structures.
- Wildlife accommodation guidelines –Consider goals (listed above) in roadway design and maintenance.

Other Comments:

- This document was developed for roads within an urbanized, congested and densely-populated area far different from Montana. Although it appears to focus on minor tweaks that may not fit Montana's vast topography and larger wildlife inhabitants, this document is forwarded for further consideration.

Design of Bridges and Culverts for Wildlife Passage at Freshwater Streams

Goals:

- Provide designers and decision-makers with a framework for incorporating context sensitive design and multi-modal elements into transportation improvement projects.
- Ensure investments in transportation infrastructure encourage projects that are sensitive to the local context while meeting the important needs of the people of Massachusetts.

Outline:

- Massachusetts River and Stream Crossing Standards
- Criteria for Wildlife Passage at Bridges and Culverts
- Design Approaches for Wildlife Passage at Stream Crossings
- Constraints on Providing Passable Stream Crossings
- Project Development and Design for Stream Crossings

Other Comments:

- Design standards are not forwarded for further consideration.

NEW MEXICO

The New Mexico Department of Transportation (NMDOT) developed a research project “Wildlife Road Fatalities Project” to further investigate two long-range objectives in the 2025 Statewide Multimodal Transportation Plan. Two of the long-range objectives deal specifically with wildlife-vehicle encounters: 1) reduce wildlife-vehicle collisions and 2) improve coordination between NMDOT and NM Department of Game and Fish to identify and develop solutions at critical wildlife crossings. (ATR Institute, 2006).

Goals:

- Identify accident-prone locations and accident trends
- Direct cost-effective mitigation efforts
- Evaluate the effectiveness of mitigation techniques
- Provide data for highway planning purposes
- Model and forecast accidents
- Analyze traffic and climatic relationships for species-specific accident trends
- Develop species-specific accident risk profiles for highway corridors
- Establish policies and strategies for accident issues and mitigation initiatives

Outline:

- Literature review
 - Prevention and mitigation
 - Transportation planning and the collaborative process
- Project Development
 - Research Advisory Committee
 - Web site development
- Future research

Other Comments:

- New Mexico identified the document, WARS 1983-2002: Wildlife Accident Reporting and Mitigation in British Columbia Special Annual Report, as a successful project to use as a model for New Mexico.

- Both the British Columbia Annual Report and the NMDOT Wildlife Road Fatalities Project are closely tied to data collection which does not provide a representative framework for MDT's process.
- This document did not offer process input and therefore was not forwarded for further consideration.

OREGON

Oregon utilized the Wildlife Movement Strategy which is an interagency working group to address barriers to wildlife movement within the state. To support these goals, Oregon Department of Fish and Wildlife, with agency partners including the Oregon Department of Transportation (ODOT), Federal Highways Administration (FHWA), the U.S. Forest Service (USFS), the U.S. Fish and Wildlife Service (USFWS) and others, held a series of workshops throughout the state in 2007. The workshops identified wildlife linkages, which are key movement areas for wildlife, with an emphasis on areas that cross paved roads (Hatch, Undated).

In Oregon, work towards providing for wildlife connectivity is taking place under the Oregon Conservation Strategy (OCS). The OCS is Oregon's State Wildlife Action Plan (SWAP), part of a big-picture framework for conservation.

Goals:

- Create a priority linkage area for Oregon

Outline:

- Background
- Procedures
- Results
- Who has a role in finding linkage solutions
- What types of transportation projects may trigger linkage solutions
- Challenges and recommendations for further work on this project

Other Comments:

- This document did not offer process input and therefore was not forwarded for further consideration. Development of a priority linkage may be beneficial for MDT at a later date.

PENNSYLVANIA

Pennsylvania Department of Transportation (PennDOT) included Wildlife Crossings guidelines in Chapter 20 of its Design Manual (PennDOT, 2012). Most of the information in this guidance was derived from FHWA's Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects and Wildlife Crossing Structure Handbook Design and Evaluation in North America.

Goals:

- Provide a safe and efficient transportation infrastructure for the traveling public
- Provide a guidance should an Engineering District elect to study and construct a crossing or exclusionary device

Outline:

- Wildlife crossing types
- Wildlife design groups
- Policy/Guidance- PennDOT developed guidance including:
 - Specific project requirements including traffic volumes exceeding 4,000 vehicles per day and a high mortality rate for the target species which are more suited to an urbanized and densely-populated area-far different from Montana.
 - Consider the need for a wildlife crossing or exclusionary device when a state or federal resource agency has expressed a science-based need for a wildlife crossing, in conjunction with the Department, for a target species. A target species is identified as the subject of a conservation or monitoring action.
 - An application form for wildlife crossing consideration requiring documentation or studies to substantiate the request and clarification that PennDOT will not generate this data.
 - PennDOT allows for participation by a funding partner.
- Design - included wildlife crossing features in the design manuals.

- Wildlife fencing –Addressed exclusionary fencing in the design manuals.
- Determining effectiveness

Other Comments:

- This design manual was developed for roads in urbanized areas different from Montana's roads or wildlife. It appears to focus on accommodation requests based upon science needs from resource agencies or significant data. This document did not offer compatibility with Montana's roads or wildlife and therefore was not forwarded for further consideration.

TEXAS

Texas Department of Transportation (TxDOT) has established a Wildlife Activities guidance document (Jenkins, Undated). This guidance is focused toward minimizing roadway effects on individual mammal species common in Texas.

Goal:

- Minimize roadway effects on wildlife

Outline:

- Introduction
- Brown pelican
- Bats and bridges
- Ocelot
- Concho water snake
- Houston toad
- Conclusion

Other Comments:

- TxDOT and Texas Parks and Wildlife (TPWD) have signed a memorandum of agreement (MOA) detailing the level of information needed to adequately describe the natural habitat in the vicinity of a proposed project. The MOA also provides criteria to be used for the consideration of mitigation for any habitat impacted. This MOA will streamline the environmental review process by providing uniform guidance and criteria for habitat description and mitigation. This document did not offer process input and therefore was not forwarded for further consideration.

UTAH

Utah Department of Transportation (UDOT) has two guidance documents that address wildlife crossings and animal-vehicle collisions.

Determining Wildlife Use of Wildlife Crossing Structures Under Different Scenarios

Prepared by Utah State University for UDOT, this report analyzed crossing efficiency and provided recommendations at 14 designated wildlife crossing culverts and bridges and 21 existing culverts and bridges built for other purposes (Cramer, 2012).

Goal:

- Help wildlife and transportation professionals understand the effects of structure variables such as height, length, width, and structure type on wildlife use of those structures to pass over and under Utah roads.

Outline:

- Research Methods
- Data Collection
- Data Evaluation

Other Comments:

- This document did not offer process input and therefore was not forwarded for further consideration.

Wildlife & Domestic Animal-Vehicle Collisions

Wildlife QIT, a research organization, prepared the Wildlife & Domestic Animal-Vehicle Collisions toolkit for UDOT (Wildlife QIT, 2005).

Goal:

- Toolkit contains a summary of valuable information regarding animal-vehicle collisions that can be used consistently throughout UDOT and updated as needed to reflect current practices. This toolkit has several items that MDT could utilize for process development including:

Outline:

- Background information:
 - Data collection
 - Domestic “hot spots” – Defined with a threshold greater than four crashes /mile.
 - Wildlife hits – Defined with a threshold greater than 20 crashes/mile
 - Functional classification/prioritization of state routes
- Planning - including early project examination/identification, early environmental/planning coordination, long range plan of costly projects, and usage of the statewide transportation improvement plan
- Mitigation measures
- Policy & standards (could not confirm if this was ever developed)
- Communication/Coordination with stakeholders/agencies
- Funding sources
- Performance measures

Other Comments:

- This document is discussed further in the report, due to processes identified and the application of a toolkit.

VERMONT

Vermont Agency of Transportation (VTrans) has developed a Transportation & Habitat Connectivity Guidance Document (VTrans, 2012). **Goal:**

Provide best-management-practices addressing wildlife vehicle conflicts and habitat connectivity. **Outline:**

- Planning
 - Assessment of existing connectivity
 - Impact assessment and identification of conflict areas
 - Prioritization of projects
 - Analysis of potential mitigation options
 - Monitoring and adaptive management
- Design and construction – discussed enhancement of existing structures, wildlife structures and right-of-way access control structures.
- Operations and maintenance – Discussed driver based solutions and maintenance inventories and monitoring.

Other Comments:

- This document is discussed further in the report.

VIRGINIA

Virginia Department of Transportation (VDOT) has published three research studies regarding animal vehicle collisions these include: A toolkit of measures for reducing animal-vehicle collisions (Donaldson, 2006), An Evaluation of Roadside Activity and Behavior of Deer and Black Bear to Determine Mitigation Strategies for Animal-Vehicle Collisions (Donaldson, 2015), and The Use of Highway Underpasses by Large Mammals in Virginia and Factors Influencing their Effectiveness (Donaldson, 2005).

A Toolkit of Measures for Reducing Animal-Vehicle Collisions

Goals:

Develop a toolkit that provides information on measures to consider to reduce animal-vehicle collisions and/or to provide safe wildlife movement across a roadway.

Outline:

- Purpose and Scope
- Methods
- Results
 - Effectiveness of Mitigation Techniques to Reduce Animal-Vehicle Collisions
 - Measures Determined to be Ineffective or Have Limited Effectiveness
 - Measures Known to be Effective or Require Additional Research
 - Wildlife Crossing Considerations and Design
 - When to Consider a Wildlife Crossing
 - Habitat Corridors
 - Modifying Existing Structures to Accommodate Wildlife Passage
 - Wildlife Crossing Design Elements
 - Design Considerations for Large and Medium-Sized Mammals

- Design Considerations for Small Species
- Fish Passage
- Variables that influence road-crossing attempts
- Costs and Benefits Assessment
 - Cost of Mitigation Versus benefits in property damage savings
 - Cost of mitigation versus benefits using multiple parameters

Other Comments:

- The objective of this study was to develop a toolkit for transportation planners and environmental staff during planning and it provides information on measures to consider to reduce animal-vehicle collisions and/or provide safe wildlife movement across a roadway. It is to be utilized as a quick-guide and does not address species specific information.
- This toolkit is a good source for wildlife accommodations or mitigation but lacks policy data beneficial for WAP development.
- This document did not offer process input and therefore was not forwarded for further consideration.

An Evaluation of Roadside Activity and Behavior of Deer and Black Bear to Determine Mitigation Strategies for Animal-Vehicle Collisions

Goals:

- Evaluate white-tailed deer activity and behavior along two defined areas:
 - An interstate roadside adjacent to unfenced isolated underpasses used by deer and
 - A stream corridor / highway intersection with no viable underpass for deer.

Outline:

- Successful animal vehicle collision countermeasures
- Preliminary evaluations
- Camera monitoring to inform mitigation decisions
- Purpose and scope
- Methods
- Results and discussion
- Summary of findings
- Benefits and implementation

Other Comments:

- Although not a primary focus, black bear and other wildlife activity was also evaluated. Two years of camera data and animal carcass removal data were analyzed to gain a better understanding of deer and black bear activity and behavior relative to the two road and landscape features.
- This document focused on very select monitoring of locations and species.
- This document did not offer process input and therefore was not forwarded for further consideration.

The Use of Highway Underpasses by Large Mammals in Virginia and Factors Influencing Their Effectiveness

Goals:

- Determine the effectiveness of VDOT's existing large mammal crossings
- Determine the design and location attributes that make a wildlife crossing successful in terms of use by Virginia's large mammals and the associated influence on animal-vehicle collisions

Outline:

- Methods
- Results and Discussion
- Conclusions
- Recommendations

Other Comments:

- This report provided guidance in choosing cost-effective underpass design and location features to increase motorist safety and habitat connectivity.
- The findings demonstrated that property damage savings due to reducing deer-vehicle collisions can outweigh the construction costs of an effective underpass. Due to assumed traffic volumes on Virginia roads, it is unlikely this conclusion can be applied in Montana.
- This document focused on wildlife underpass monitoring.
- This document did not offer process input and therefore was not forwarded for further consideration.

WASHINGTON

Washington State Department of Transportation (WSDOT) is currently working on a statewide habitat connectivity assessment that will identify areas where wildlife require mobility. In addition to this planning work, WSDOT is incorporating wildlife protection measures in its projects.

There has been one research study performed, An Analysis of Deer and Elk-Vehicle Collision Sites along State Highways in Washington State. This study was performed by the Washington Department of Fish & Wildlife and sponsored by WSDOT (Myers, 2008).

Goals:

- Develop maps delineating spatial relationships between known movement corridors and seasonal ranges of white-tailed deer, mule deer, black-tailed deer, and elk throughout Washington in relation to state and federal highways
- Develop statistical models which identify significant association between deer-vehicle collisions and highway, landscape and deer biology attributes
- Identify and summarize potential locations where movement corridors are at risk of potential bottlenecks or other barriers that may result in elevated numbers of deer/elk on state highways.

Outline:

- Methods
- Results
- Discussion
- Management Implications

Other Comments:

- This report focused on wildlife connectivity. Development of a state-wide habitat connectivity assessment may be beneficial for MDT at a later date.
- This document did not offer process input and therefore was not forwarded for further consideration.

WYOMING

Wyoming Department of Transportation (WYDOT) has published three research studies regarding animal vehicle collision and road-crossing behavior of deer. These studies include: Evaluating the effects of deer delineators on wildlife-vehicle collisions in northwest Wyoming (Hall, 2012), Planning-Support for Mitigation of Wildlife-Vehicle Collisions and Highway Impacts on Migration Routes in Wyoming (Hart, 2014) and Traffic Thresholds in Deer Road-Crossing Behavior (Riginos, 2015).

Evaluating the Effects of Deer Delineators on Wildlife-Vehicle Collisions in Northwest Wyoming

Goals:

- Understand the degree to which deer delineators installed in Fremont, Hot Springs and Big Horn counties have reduced the number of wildlife vehicle collisions (WVCs).
- Quantify biotic and abiotic factors that influence WVCs and determine the relative importance of each predictive factor.
- Examine the effect of delineators on mule deer behavior road-crossing patterns and crossing locations.

Outline:

- Objectives
- Benefits
- Work plan/scope
- Work schedule
- Cost Estimate
- Implementation Process
- Technology Transfer

Other Comments:

- This report focused on measuring the performance of a specific type of wildlife accommodation-deer delineators.
- This document did not offer process input and therefore was not forwarded for further consideration.

Planning-Support for Mitigation of Wildlife-Vehicle Collisions and Highway Impacts on Migration Routes in Wyoming

Goals:

- Improve our understanding of the spatial patterns and causes of deer-vehicle collisions
- Update and verify assessments of where existing and planned future collision mitigation measures should be located
- Predict where future increases in collisions (and decreases in crossing ability) are most likely to occur in order to plan future actions and funds necessary to mitigate these effects

Outline:

- Problem statement
- Problem background
- Current conditions
- Study objectives
- Study benefits
- Applicable questions
- Statement of work

Other Comments:

- This report focused on understanding deer mobility and related vehicular collisions and developing a prediction model.
- This document did not offer process input and therefore was not forwarded for further consideration.

Traffic Thresholds in Deer Road-Crossing Behavior

Goals:

- Cost Benefit: Reduce costs and improve performance for Highway Safety and Planning programs by informing WVC mitigation planning
- Improving Safety: Reduce transportation-related injuries by reducing WVC

Outline:

- Study objectives
- Goals
- Study Benefits
- Output and outcome measures
- Performance measures
- Applicable questions
- Statement of work

Other Comments:

- This report focused on developing a relationship between traffic volumes and deer behavior in crossing roads.
- This document did not offer process input and therefore was not forwarded for further consideration.

APPENDIX A-2: INTERVIEW MEETING NOTES

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Meeting Minutes - Wildlife Accommodations Process

Development

Date: 6/9/2016

Time: 4 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, J. Weigand, Bill Semmens, M. Traxler

Attending:

Name	Organization	Phone Number	E-Mail
Ed Toavs	MDT	523-5800	etoavs@mt.gov
Shane Stack	MDT	523-5800	sstack@mt.gov
Joe Weigand	MDT	444-9205	joweigand@mt.gov
Bill Semmens	MDT	444-7227	bsemmens@mt.gov
Mark Traxler	RESPEC	502-1881	Mark.traxler@respec.com
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on 6/9/2016 at 4 PM at the Missoula District Office to discuss previous experiences with wildlife accommodations (WA) into transportation projects. *Action items are shown in italics.*

1. Wildlife accommodations could include:
 - a. Fencing
 - b. Accommodation (crossing)
 - c. Electro-mats
 - d. Fish crossing in culverts
 - e. Combination of these items
2. Shane Stack offered the following:
 - a. Data Needs:
 - i. Baseline data is needed. Data (such as tracking beds for animal movement) can be provided before the project nomination process.
 - ii. Data is needed for fencing limits. Need to determine how much additional fencing is needed outside of the accommodation feature.
 - iii. Need accurate design needs and sizing data for specific species.

3. Policy Needed:
- a. Land Use - Once MDT installs a wildlife structure, it needs to be protected against future land use changes that would cause the animal movement/need to change. Outside agency cooperation and input is needed in these instances to avoid the additional use of public monies.
 - b. Fencing Ownership (and Maintenance). Standard fence is on land-owner property. Wildlife fence is on MDT property and therefore MDT is responsible for maintenance.
 - c. What are feasibility limits for wildlife treatments?
4. MDT Nomination process needs data and data-driven decisions. Presently the process is more of a chicken and egg situation for wildlife accommodations.
- a. How can you get good-enough wildlife data at project nomination? Can risk level be included at nomination, rather than full data?
 - b. Data source likely to be wildlife or fisheries specialists-district biologist.
 - c. *Ask Planning about mining data?*
 - d. Is there a database for selection of WA treatments and feasibility?
 - e. Presently, secondary projects are nominated by County who often may not have WA understanding. How do we account for this?
 - f. How to VA WA excesses (past example was Highway 83 "feel" required two undercrossing & 1 overcrossing)?
5. Projects outside construction nomination process:
- a. Should they or do they consider WA? Are maintenance and safety WA concerns addressed?
 - b. Will feasibility studies or OT funding utilize WA?
 - c. Can a questionnaire be developed for other (non-construction) projects such as safety, widening, culvert replacement, pavement preserve, etc.?
 - d. Does WA have to be data-driven at this point?
6. Location of District Biologist is an issue. Better interaction with biologists when they are in the district. Greater interaction is specially needed at the nomination process.
7. Continuity and predictability:
- a. EIS or EA can be a decision document. Timing does not fit for nomination.
 - b. Can cat-x be decision document?
8. Comments on Missoula District 1
- a. District has more than 20 years' experience of applying treatments.
 - b. Environmental Stewardship message engrained in the culture now (was not 20 years ago,) and is part of MDT's mission.
 - c. Environmental is embedded in all levels, beginning at DA.
 - d. District initiates regular meetings with FWP to build relationships
 - e. District believes early agency awareness has long-lasting and deep benefits
9. MDT internal challenges:

- ↳
 - a. Costs of maintenance of WA is not reflected in increased funds. It is presently a challenge to provide maintenance as existing funds keep getting stretched. This challenge will continue for the foreseeable future.
 - b. Functional Units are perceived to have a disconnect and (likely) minimal WA knowledge. Education regarding WA is needed.
 - c. Field visit for entire team (including functional leaders) are difficult logistically, but can be very valuable.
 - d. Construction presently does not have culture accepting WA.
 - i. Safety benefits are in culture and understood.
 - ii. WA makes drivers and animals less vulnerable
 - e. Regulatory agency involvement and timing is challenging.
 - f. Nomination Stage needs to address:
 - i. Regulatory agency involvement or concurrence.
 - ii. Needs for timing and cost impacts.
 - g. *There is no current method to include outside funding for WA.*
 - h. Legislative perceptions can be unpredictable and could impact future funding or direction.
- 10. US 93 (north) wildlife procedures that were beneficial include:
 - a. The MOA was a high-level, policy direction document that resulted in mutual cooperation and establishment of mutual goals.
 - b. Multi-disciplinary interaction, between engineers and scientists, was key in successful concept development and implementation.
 - i. Issues were addressed in the field (not just during plan reviews).
 - ii. Each meeting summarized results-to ensure participants concur and can move forward without revising the issue multiple times.
 - iii. Follow through on multi-disciplinary meetings is critical as months (or years) can elapse between these communications.
 - c. The Missoula MDT District has adopted a culture that environmental stewardship is embedded through all levels and staff types. There is acceptance and understanding of incorporating wildlife accommodations into road projects.

Meeting Minutes - Wildlife Accommodations Process

Development



Date: 6/9/2016
Time: 4 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, J. Wiegand, Bill Semmens, M. Traxler

Attending:

Name	Organization	Phone Number	E-Mail
Dale Becker	CSKT	676-2700 x 7278	daleb@cskt.org
Whisper Means	CSKT	676-2700	whisper.means@cskt.org
Joe Weigand	MDT	444-9205	joweigand@mt.gov
Bill Semmens	MDT	444-7227	bsemmens@mt.gov
Mark Traxler	RESPC	502-1881	Mark.traxler@respc.com
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on 6/9/2016 at 4 PM at the CSKT Headquarters to discuss previous experiences with wildlife accommodations (WA) into transportation projects. *Action items are shown in italics.*

1. Dale Becker reflected on the history of the US 93 corridor, from the 90's road plans to development of the governing MOA and EIS to the continuing efforts under the SEIS. Key highlights include:
 - a. SEIS's longevity needs updating as time passes but the sites and issues are still consistent with the original, multi-agency decision documents (the SEIS and EIS).
 - b. Noted a frustration that the most critical (wildlife and possibly cultural) segment has not yet been built although there is progress toward building it.
 - c. Benefits to beginning tribal consultation or coordination at the concept of a project include integration of tribal interests, concerns, and knowledge at early stage
 - d. Policy agreement at the highest level (the MOA) set the stage for this corridor moving forward. Once signed, technical staff could proceed forward in consistent and predictable manner with common goals. TDC meeting with break-out discussion resolved individual design issues and was a great detail and information sharing event.
 - e. Communication is still a challenge.
 - f. Local (tribal) specialists' knowledge should be sought and used.
 - g. Consultant-led VE sessions were beneficial and resulted in a good process for changes.

2. Whisper Means reflected on additional issues including:
 - a. Communication is ongoing issue and needs to extend to all staff, agencies and consultants involved. The wildlife accommodation process could assist with such continuity across the board.
 - b. Post-construction monitoring is beneficial.
 - c. Maintenance data, focused on wildlife carcass collection, should be tracked consistently to provide baseline information. Discussion continued about the consistent application of crash data-whereas wildlife carcass data is not (yet) collected accurately enough to be considered in same manner. Challenges are due to different jurisdictions, agencies, smaller animal carcasses which are not removed in same manner, and statewide differences. Development of a mobile-based app is desirable but has other issues. UDOT has developed an app.
 - d. How to integrate wildlife corridor data into road projects is ongoing challenge. Discussion noted that early involvement helps address this issue.
 - e. Education relating to wildlife/road interaction and impacts needs to expand. Engineers have benefited from the continual work within the US 93 corridor-but ongoing education is needed for both engineers and scientists. Education needs to include standards relating to large carcass removal from not only local highways, but preferably across the state.
 - f. Previous communication of wildlife efforts involved:
 - i. Western Governors' Association meetings
 - ii. ARC - Animal Road Crossing. Existing handbook for type of crossing and location. Kathy noted this is a process effort and not focused on the final solution(s).
 - g. Working Groups with engineers and scientists both listening and learning provided long-term benefits for projects. These meetings became less frequent which resulted in a slowdown in communications.
3. General Discussion on Communication:
 - a. Early notification of potential projects was again discussed. The MDT STIP is not utilized by CSKT as a means of project tracking and development.
 - b. Proximity of MDT biologists to the agency is a strong benefit for enhancing communication.
 - c. Personal meetings in the field to review/discuss projects are needed.
 - d. Previous efforts by MDT to meet annually or bi-annual with FWP resulted in valuable information sharing. This type communication could be re-instated to include the wildlife component.
4. Summary of US 93 (north) wildlife procedures that were beneficial included:
 - a. The MOA was a high-level, policy direction document that resulted in mutual cooperation and goals.
 - b. Multi-disciplinary interaction (engineers and scientists) was key in successful concept development and implementation. This interaction was enhanced by:
 - i. Addressing issues in the field (not just plan reviews).

- ii. Summarizing the results of each meeting to ensure participants concur. This allowed the participants to move forward without revising the issue multiple times.
 - iii. Follow through on meetings while recognizing that months (or years) can elapse between communications.
 - c. The Missoula MDT District now has a culture of environmental stewardship embedded through all levels of staff. This has resulted in a level of acceptance and understanding of incorporating wildlife accommodations into road projects that needs to continue.
5. Summary of other (non-process) items that may be of benefit include:
- a. Broadening engineers' education toward road ecology by having them attend classes. A previous MSU class regarding road ecology resulted in broader base of awareness. Similarly, scientific education could also be considered.
 - b. MDT rotation of engineers provides broader exposure to environmental and field issues.
 - c. Recommend attending an ICOET conference
 - d. Similarly recommend attending MUSTACIS Institute and developing a mobile app.

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 6/29/2016

Time: 1:00 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Dave Hand	MDT - Great Falls	454-5887	dhand@mt.gov
Steve Prinzing	MDT - Great Falls	454-5899	sprinzing@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on June 29, 2016 at 1:00pm at Great Falls MDT office to discuss previous experience with wildlife accommodations (WA) in transportation projects. *Action items are shown in italics.*

1. Steve's involvement with WA included:
 - a. Havre East (fencing)
 - b. Lincoln East (two large undercrossing structures and fencing)
 - c. Kiowa North & South (enlarged structure for wider opening for possible wildlife use)
2. WA needs were generally identified by MDT Biologist as a recommendation or a safety recommendation (based upon crash reports).
3. Timing on past experience:
 - a. Havre East project was midway in schedule delivery and addition of WA caused minimal issues. Decisions regarding WA need to be consistent and predictable. Size of crossings need to be consistently determined. Currently WA appears to be based upon limited data and general feel. There is a perception that USFWS requires larger vertical openings in crossing structures. But there is no justification that the decision is based upon science or gut feel.
 - b. Lincoln East decisions were late in project and caused funding and design issues.
4. Desired Timing of WA decision:
 - a. Major crossings: before AGR, to establish the alignment and grade. Unsure if information is adequate at PFR stage.

- b. Minor crossings or culvert treatments (fish and small mammal passage): post AGR, as they should not affect grade. Need WA before PIH. Needs for this treatment should be covered in enviro document (which is presently between AGR and PIH).
 - c. Fencing is typically designed late in design process. Wildlife fencing limits may need to be different than standard fencing. Discussed the ownership and maintenance of fencing. The District noted additional maintenance with hog-wire type fencing as it traps litter if not placed on the highway-side of the post.
- 5. Feasibility of WA treatments:
 - a. Identify need as early as possible to include appropriate funding. It is unlikely that the need is known at project nomination due to lack of definition of the project itself and lack of data (safety or scientific) to determine need for WA.
 - b. The District recognizes numerous wildlife encounters are not recorded. Dave and Steve agreed any non-reported incidents were generally not creating significant property damage or injuries. May not need to change this data collection but adjust to recognize the lack of data.
- 6. Engineering issues:
 - a. Terminus of (wildlife barrier) fencing creates new challenge
 - i. Terminus channels animal onto roadway and can't exit due to wildlife fencing.
 - ii. Terminus becomes new crash point as animals are focused here.
 - b. Crossing sizes-what is scientifically needed? Don't build multiple crossings-build based upon need for animal crossing purposes.
 - c. Fencing heights-what is scientifically needed (e.g., deer height versus elk height)?
- 7. Maintenance projects: Maintenance personnel tend to be reactive and feel they don't need WA's. Feel MDT's environmental specialist typically can cover the permitting needs for maintenance projects.
 - a. Should WAP interview this role from District?
 - b. Should un-mowed ditches (tall grasses) be considered a wildlife hazard with possible treatment?

Other Notes or Information

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/1/2016

Time: 10:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT



Attending:

Name	Company/ Organization	Phone Number	E-Mail
Jennifer Nelson	MDT Butte - Design	406-494-9636	jennelson@mt.gov
Jennifer Davis	KLJ	406-447-7764	Jennifer.davis@kljeng.com
Kathy Harris	KLJ	406-441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 1, 2016 at 10:00am to discuss current and previous experience with wildlife accommodations (WA) in transportation projects. *Action items are shown in italics.*

1. WA process is currently disjointed from both the process and District prospective.
2. WA needs to be completed through the entire project design cycle, starting at PFR.
 - a. Project schedule is set at PFR and don't want a later WA inclusion to impact schedule (due to an early decision not being made).
 - b. Need actionable information for timing.
3. WA needs are similar to hydraulics (e.g., appurtenance that conveys alternate transportation across/through the road corridor). The methods are the same, but different needs.
 - a. Consider similar process to hydraulics:
 - i. Initial Recommendation Memo (*consider providing examples of justification for inclusion and exclusion of WA process*). Could be after PFR or early stages of project. Perhaps at PFR?
 - ii. TSL type report to justify type, size, and location. Discuss WA options and recommendation. Justify recommendation.
 - iii. Decision document is then carried forward.
 - iv. Consider if there is need to revisit recommendation at later project design stages, especially for projects with long-life. This could be similar to wetland delineation updates.
4. Need Biologists to attend/participate in PFR's.

- 5. Need education for both engineers and environmental scientists.
- 6. MDT's Environmental and Engineering communication. Often, engineering is seeking the Why of including a WA and seeks a data-driven justification. Justifications need to be thorough to address the issue and justify not revising/rescinding or changing the decision.
- 7. Need to have better documentation of wildlife movements/corridors, etc. Suggested working with other entities (other resource agency specialist and possible GIS data bases) to establish corridors for species of concern, T&E species, etc. that affect transportation corridors. More data will provide better justification and avoid an arbitrary or weak justification. Note: design standards for wildlife crossings are outside scope of this study.
 - a. Arizona and Florida may be examples of states to review for process development.
- 8. The WA decision may need to have periodic checks throughout the life of a project. This is especially important for projects with long lives to incorporate science advances that should be considered.
- 9. Good experiences with WA
 - a. Pavement Preservation (PP) project, Manhattan to Belgrade
 - i. District staff reviewed safety and carcass data prior to PFR. Field evaluation occurred at PFR with both Biologist and Design. Review concluded with the conscious decision to avoid WA.
 - ii. Identified wildlife safety issues early on.
 - iii. Addressed WA in a comprehensive manner in the field.
 - iv. After determination of no WA for this project, it was then documented in a decision document similar to the PFR.
 - b. Stone Creek (NH road widening)
 - i. Early need was identified for the northern portion of project due to carcass data.
 - ii. Reviewed possible wildlife crossings locations at AGR and in field. Because this review occurred prior to Geotech field work, additional Geotech drilling could be efficiently obtained in potential crossing areas. Project delay was avoided (for this issue) and allowed field work to be combined with ongoing efforts-avoiding re-mob costs.
 - iii. Obtained more Geotech field data than likely needed, but it was collected in a cost-effective and non-schedule-delaying manner. Thus, saving costs and time.
 - iv. AGR field discussion allowed the subsequent public meeting to also discuss wildlife crossings. This allowed landowners to note areas with conflicts or better crossing locations for both wildlife and agricultural grazing.

10. Detrimental experiences with WA

- a. Checkerboard- Martinsdale bridge was oversized for both hydraulics and WA needs and was noted as a possible redundancy. Need and design appeared to be based not on data, but on gut-feel meaning the bridge opening increased for wildlife after hydraulics had also increased opening. Justification of WA need should be thorough. Also, need comprehensive review of design needs.
 - i. Poor communication
 - ii. Is was uncertain whether the final vertical clearance was justified or just compounded.
- b. Florida State Road 29 - Panther crossing
 - i. No future land use planning was considered when wildlife crossings were added.
 - ii. Area now developed and has panthers within subdivision. Florida now limits WA crossings to locations where public lands are on either side of crossing to assure future land uses.
 - iii. Similar concern in Missoula District. (*Consider step to review land uses?*)
- c. Bridger Canyon corridor study
 - i. The study may have been too wide-ranging. Thus, it has been a challenge to utilize adequate data.
 - ii. WA need may exist for certain corridor projects.
 - iii. Uncertain how to scope for corridor projects.

11. Concurred with other comments Kathy offered from WA interviews:

- a. Annual meeting with agencies to inform of upcoming MDT projects would be a primary responsibility for district biologist and could be beneficial. It would purely be an information exchange; however, and therefore no project specifics would be discussed. The issue with these types of meetings is that attendees are typically higher level staff-not project or permitting staff.
- b. MDT's Maintenance Process is not a good fit for WA.
- c. Wildlife fencing on MDT R/W is different from landowner maintained, standard fencing. Does WA affect R/W need or negotiations as wildlife fencing affects landowners?

12. Consider no separate flow charts for entire WA process. Don't add activities just to add activities.

13. Funding allocations

- a. Environmental currently has control and advocacy but no monetary responsibility (e.g. what other projects will be impacted due to increasing project costs for WA). Consider establishing environmental monies for WA. Perhaps a state-wide pool to draw from, that could consider combining project funding for greater benefit but has limits to be cost-efficient.
- b. Is there possible way to include other state (agency) or private funding?

14. R/W Acquisition.

- a. R/W is a later stage of MDT project delivery and often drives the final schedule. How does this interact with WA? (see benefits on Stone Creek). Early landowner meetings could be considered to confirm WA.

- b. Timing for fencing is after PIH and wildlife fencing is currently after acquisition.
Is this beneficial? Is this considered R/W coordination?
- 15. Should Corridor Studies include WA due to limited engineering occurring at this level?
- 16. Greater use of OT type funding is meant to provide better assessment of projects at nomination stage. How or if to include WA for these feasibility studies?



Other Notes or Information

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/5/2016

Time: 2:30PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT; Others?

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Deb Wambach	MDT Helena - Environmental	444-0461	dwambach@mt.gov
Jennifer Davis	KLJ	447-3347	Jennifer.davis@kljeng.com
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 5, 2016 at 2:30pm at MDT Planning to discuss current and previous experience with wildlife accommodations (WA) in transportation projects. *Action items are shown in italics.*

1. WA include:
 - a. Crossing
 - b. Fencing
 - c. Technology
2. WA can be a strategy:
 - a. To increase vehicular safety
 - b. To increase wildlife permeability and connectivity
 - c. That is adaptable and dependent on results by accounting for the future
3. Desires of WA:
 - a. Should seek opportunity for WA when project scope allows for actual solution.
 - b. Need program-wide process for projects that have a real change. May not need to include WA considerations in:
 - i. PP
 - ii. Safety
 - iii. Signals
 - iv. *But does that omit item 3a?*
 - c. Need predictable and consistent process.
 - d. Need documented process.

- e. WA needs to become part of the MDT culture and considered in scoping/project development.
 - f. Currently, WA are not documented in MDT's processes. Wildlife do not have a review task in each project milestone as aquatic resources do.
 - g. WA doesn't have the data-driven support (b/c ratios) that justify items that engineers are used to justifying. Need softer ratios to reflect larger picture.
 - h. Don't add new activities. Add formalities and tasks to the existing process without adding lots of additional work.
 - i. Include good documentation examples for PFR, SOW, justification of inclusion or exclusion, etc.
4. WA Process:
- a. WA do not need to be cutting edge or state of the art.
 - b. Desire unique processes and guidelines for Montana.
 - c. MDT staff need to buy into the process at all levels including Construction & Maintenance.
 - d. Biologists can help educate (MDT staff) on WA purpose and need.
 - e. Corridor studies need to include WA.
 - f. Ideally the whole design team would buy into the need, consider feasibility, and then prepare design (plans). Need Construction buy-into process.
 - g. Noted conservation values may be considered soft values.
5. Wildlife Knowledge: Biologists are currently the knowledge base. Data is GIS based (but limited).
- a. Maintenance staff know the wildlife migration paths in some areas.
 - b. Some non-profit resources, FWP or resource agencies have databases. It is easier to get shared data if a relationship exists between staff at the various agencies.
 - c. WA needs to include outreach. WA are not just safety related (crash/carcass) data, there are many components (migration patterns, wildlife movement corridors etc.) that need to be evaluated.
 - d. WA need to have soft values that are not assigned based upon the value of benefit/cost analysis (BCA).
 - e. WA advancements can collect data to include connectivity through GIS using priority linkage, regional analysis and coordination with other agencies and non-profits. Would like to see knowledge base transfers between the different entities. Currently, some agencies require specific and/or special requests to acquire data which can be burdensome. Noted some agencies have shared servers with MDT. All agencies need to buy into WA.

6. Funding for WA
- Consider private or non-profit
 - Ask DA's if separate (MDT) fund for WA would be benefit?
7. Feasibility of WA:
- Crash carcass data - some data is more thorough than others and there is inconsistency. Some districts map birds, coyotes, etc. while others do not.
 - Safety data (and b/c) is a clear, known concept. How can MDT include WA in similar projects with limited data?
8. Example of good WA:
- Corridor Studies:
 - Paradise Valley (Livingston to Gardiner) - 50% of the crashes were due to wildlife. Conditions were known prior to start of the project and helped with the scope. However, knowledge of wildlife did not help in the proper budget development.
 - South of Livingston Turn lane - WA are being considered in scope and budget up front.
 - Manhattan Pave Pres (PP) & fencing- Based on known wildlife patterns/crashes, reviewed existing structures for WA. Structure sizes did not fit; so, decision to exclude WA treatment at PFR stage.
 - I-15 Interstate Fence replacement - Jefferson City to Montana City corridor - Known wildlife patterns/crashes and safety/connectivity for wildlife. Project limited by funding so budget limited possible solutions.
9. Example of poor WA:
- Mission Interchange - Project removed concrete bridges and replaced with small culverts instead of box culverts. Long (150') culverts would not get used by wildlife; therefore, culverts were replaced at existing size and no enlargement for WA. Designers wanted the long culverts to avoid guard rails. *Design Exception would be required and is a separate issue that may or may not be approved for WA.*
 - PP projects do not typically include WA. *Is this acceptable?*
10. ROW -
- Meetings with affected landowners should be held to confirm that land operations and WA will work in identified locations. This could occur prior to PIH and would need to be coordinated with designers.
11. WA Timing:
- Wildlife involvement is not typically performed until AGR when letters are sent to resource agencies. WA activities need to be included across the board and earlier. The BRR is the first report to identify wildlife and issues, but the cost and alignment impacts are not included until later. This typically becomes a budget issue.
 - Definitely include WA before SOW.
 - Need iterative and collaborative process for QA, around the AGR level. Should also include "collateral damage".

- d. Note: permits are aquatic driven. Allows for relationship and communicant with Fishery Resource agencies. No similar relationship with Wildlife agencies. Activity 700 may be a start.
- 12. Current Biology activities include:
 - a. 706 - Biological Resource Report
 - b. 700 - Agency Conceptual Submittal
 - c. 774 & 775 - Biological Assessment
 - d. 778- Aquatic Findings Report
 - e. 732 & 733 - SPA Permitting
 - f. 720 - Final Biological Review

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/6/2016

Time: 2:30PM

Attending:

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT;

Name	Company/ Organization	Phone Number	E-Mail
Brian Hasselbach	FHWA - ROW Environmental	441-3908	brian.hasselbach@dot.gov
Marcee Allen	FHWA Traffic/Safety Design	441-3909	Marcee.allen@dot.gov
Gene Kaufman	FHWA District Engineer	441-3915	gene.kaufman@dot.gov
Jennifer Davis	KLJ	447-3347	Jennifer.davis@kljeng.com
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 6, 2016 at 2:30pm at FHWA to discuss wildlife accommodations. *Action items are shown in italics.*

1. Wildlife Accommodations can be defined as:
 - a. Crossings, small or large
 - b. ITS devices (to warn drivers)
 - c. Strategies to address qualitative items (wildlife benefits) as part of MDT's Mission Statement
 - d. Must be wildlife dependent
2. What is your professional role with Wildlife Accommodations development and other comments?
 - a. Gene has long history with Missoula District and US 93 WA.
 - i. Missoula WA evolved from EIS documents (long-term documents). This has changed the culture in the District to where WA are included from project inception.
 - ii. Noted that currently the BRR should identify wildlife issues as the BA defines the project impacts and discusses efforts to minimize them.
 - b. Brian
 - i. Noted that the 126 (environmental document) stage is too late to efficiently incorporate WA.

- ii. Prefer WA at Planning stage
 - iii. Include WA as part of project, not a late add-on.
 - iv. *Should WA possibly be included at the STIP level* in some regional assessment or identification of hot spots in state or region? Suggested a more collaborative approach.
 - v. Corridor studies are finite and there may not be a cost associated with these inconsistent events.
 - vi. Planning studies need to include resource agency meetings and contain more dynamic conversations. Give agencies the opportunity to influence the project.
- c. Marcee:
- i. Road Safety audits (RSA) may include field visit with multiple functional area reps. RSAs can include biologist if data currently shows an issue. Biologists' input is typically only requested when (collision or crash) data shows an existing roadway impact.
 - ii. Corridor Studies:
 - 1. Fairview Corridor may have included WA.
 - 2. Paradise Valley Corridor study did include some discussion of WA.
 - 3. Brian noted that corridor studies are limited (few per year) and since the E-Scan document is a very high level, no field work is typically done. However, E-Scans offer the opportunity for a Resource Agency meeting which can include wildlife resources input and comment. *E-Scan may be an opportunity to focus on the corridor and discuss collaboratively what changes could improve the wildlife permeability but still complete the transportation goal. Projects must seek to create opportunities rather than simply request comments on the project.*
 - iii. Design Exception Reviews: No current examples were provided. Discussion centered around would an exception be approved to allow inclusion of WA.
3. WA-how to incorporate into MDT's process:
- a. Gene:
 - i. Missoula District culture embeds idea of WA from earliest stages of project. This process/thinking is based on the last 25 years of project development.
 - ii. Other example: ITS was not addressed in projects so a requirement was added to the PFR (and subsequent reports such as SOW) to address ITS. This resulted in a conscientious decision rather than a default exclusion. *Should MDT add a WA step to the decision docs and PFR?*
 - iii. Note: MDT is currently updating pavement nomination guidelines. Should this have a WA item? *Check with Lesly Tribelhorn.*
4. Examples of past WA:
- a. Good/beneficial: Missoula District.
 - i. Possibly develop a US 93 WA 'Lessons learned'
 - ii. What worked and why in the Missoula District on the US 93 project:

- 1. Funding
 - 2. Timing (within MDT Process)
 - 3. Determination/Analysis Criteria
 - 4. Need and/or Feasibility
- b. Bad/detrimental
 - i. Boulder South. Late WA addition to project and justification was weak. Additional effort was required as a result of WA.
 - ii. I-94 wildlife fencing. Wildlife fencing was added to existing road but no crossings. Fencing may have detrimentally affected wildlife connectivity due to lack of crossings.
 - iii. US 191-Big Timber to Harlowton. Same issue.
 - iv. I-team on Seeley/Swan or Clearwater area. Generally, felt this project had high WA desires from the resource specialist with no regard to impacts to the resulting highway. The team did not feel WA was beneficial and hence the lack of consensus for wildlife crossings and changes in this area (for wildlife crossings only-not fish passage). There were benefits from the I-team including interagency interaction.
- 5. Ideas to incorporate into MDT process:
 - a. PFR possibly checklist for yes/no/unsure need for WA.
 - b. Address VE-as large projects with a VE would likely review and possibly omit WA. Strong justification is needed for survival thru a VE.
 - c. Noted that BMP's were finally developed as consistent standard across all District's. Could a similar process be developed for WA?
 - d. Need statewide support from upper (MDT) management to change the culture for WA.
 - e. Suggest patterning WA after stream and wetland/mitigation standards
- 6. FHWA includes project delivery as an EDC. Don't add more steps to the process without resulting benefits.
- 7. Brian noted that monitoring seems to only occur on projects through the Research Bureau. Is there a better way to provide data for development of WA standards? What can be utilized to capture data from WA and better define both standards and benefits of these WA?
 - a. FHWA wants to close projects, therefore monitoring should not become part of construction project requirement.
 - b. Can alternate method be developed, similar to wetland monitoring that is a type of annual program?
 - c. FHWA indicated monitoring for WA could be federally eligible.
- 8. Brian noted that Washington State had different issue when they were sued for fishing rights damages due to enlarged culvert design. WA state is now having to retro-fit statewide.

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/7/2016

Time: 10:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Matt Collingwood	MDT Bozeman - Construction	406-994-2846	mcollingwood@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 7, 2016 at 10:00am at Dive Bakery to discuss wildlife accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings (culvert or bridge)
 - b. Fencing
 - c. Note: Wildlife incidents within the roadway prism are a large item. Also, occur outside roadway prism but with less impact.
2. In Construction at MDT, they are not typically involved until after decisions are made.
 - a. Lack of involvement means lack of commitment. Construction has little ownership in WA. Need a full team mentality to deliver. This team mentality should be built from bottom up but also supported by upper management (e.g., Kevin and Paul).
 - b. R/W Agreements dictate fencing type. R/W not signed until very late stages of project and at times may not be coordinated between acquisition agent and design/fencing. Additionally, wildlife fencing may not agree with the landowner.
 - c. Need to include R/W, Maintenance, and Construction in early design stages of major reconstruction projects. However, input is not needed in early stages of mill-fill type projects.
 - i. Construction (and Maintenance) should be invited to attend PFR level meetings even though Construction does not know the EPM at that time.
 - ii. Might be higher level person whom attends these meetings (Kevin C or DCE's).
 - iii. The WA process should consider better timing for Geotech.
3. WA (crossings) needs should be based upon data. Where is the data?

4. WA should allow some design flexibility.
5. Future land use should be included to preserve wildlife mobility corridor. Could easements preserve land use?
6. Monitoring of WA should not be included on construction projects as it places undue burden on the contractor. Data is valuable but not as part of Construction funding/phase. Monitoring is needed to educate (engineers) and to provide data for future decisions.
7. Feasibility of WA. Needs science-based data to balance benefit/cost type ratios.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/8/2016
Time: 10:00 AM

Facilitator: Kathy Harris
CC Minutes: K. Christensen, MDT;

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Doug McBroom	MDT Helena - Maintenance	444-6157	dmcbroom@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 8, 2016 at 10:00am at MDT offices to discuss wildlife accommodations. *Action items are shown in italics.*

1. Wildlife Accommodations can be defined as features that channel/direct wildlife:
 - a. Grade-separated crossing
 - b. Fencing & jump-outs
 - c. Shotcrete
2. Current MDT Involvement by Maintenance:
 - a. Maintenance needs to be involved in early concept/decision stage
 - b. Suggest involvement in PFR where the maintenance chief, the crew section supervisor and the superintendent typically attend.
 - c. Remaining design meetings and decision documents are not beneficial for maintenance input.
 - d. Blue sheets are reviewed by Maintenance.
 - e. Doug does not see a difference between consultant-designed or MDT-designed projects.
 - f. Maintenance must maintain WA after built. Including:
 - i. Carcass/collisions are expensive to clean up. WA can reduce Maintenance needs by avoiding the Collision altogether.
 - ii. Carcass data is not collected by GIS. It is still a paper document that is recorded by RP and offset. Once submitted, this data is then re-inputted.
 - iii. New WA features drain the limited Maintenance budget and may require monies be moved from other maintenance needs to WA maintenance.

- 3. Maintenance is balanced upon a scale of frequency and impact. Hi/low frequency versus high/low impact.
- 4. Good involvement example:
 - a. Augusta area bridge. Maintenance was involved throughout project development due to the modular type construction and experimental nature of this project. No names or further details were known at time.
- 5. Summary of critical process needs for WA and Maintenance:
 - a. Involve Maintenance at early PFR level. Document decisions in PFR documents.
 - b. Prefer consistent design features and materials to allow better efficiency for maintenance. For instance, each guardrail system has different maintenance.
 - c. Seek low maintenance features when possible.
 - d. Agency involvement: Maintenance has an agreement with DEQ at carcass compost sites. Due to contaminants in the composted material (from prions, disease causing proteins), DEQ limits area where composted material may be placed (to reduce chance of transmitting the prions to a clean site).

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/13/2016 Facilitator: Kathy Harris
Time: 2:30 PM CC Minutes: K. Christensen, MDT; Others?
Attending:

Name	Company/ Organization	Phone Number	E-Mail
Bill Semmens	MDT	444-7227	bsemmens@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 13, 2016 at 2:30 PM at MDT Planning to discuss Wildlife Accommodations. *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings, both small and large
 - b. Fencing, wildlife friendly and starting to need high-visibility for bird awareness
 - c. Modifying features such as reducing post heights to discourage raptors from roosting
 - d. Deterrent mats
2. Wildlife accommodation needs:
 - a. Currently driven by safety due to developed data base and proven safety issues and successful b/c ratios.
 - b. Wildlife needs are not understood or incorporated
 - i. Due to lack of proven data
 - ii. Connectivity is not understood. Migration and daily needs vary.
 - iii. Target species may be identified for safety, but should also look at a desirable maximum size for inclusion of other (non-target) species
 - iv. Long term costs to wildlife (w/o WA) is not understand or planned around
3. Data:
 - a. Source: Resource Agencies are primarily source of "soft" data.
 - b. Needs:
 - i. Identified early on in process.
 - ii. Define existing wildlife patterns and impacts to blockage of these patterns.
 - iii. Cost value for wildlife is not defined/included.
 - iv. Wildlife do have a non-dollar value
 - v. Carcass data is not accurate.
 1. Currently MDT Safety does track carcass data collected from Maintenance in a GIS base.

- 2. Database is only used for trend basis as not statistically valid.
 - 3. Note-UDOT has app for Maintenance to GPS carcass locations. This technology is not currently adopted by MDT.
 - vi. Monitoring provides data on usage of WA. It is very helpful but it is often not valid until years after the project is built as wildlife patterns are slow to change.
4. Education is needed for understanding of WA.
- a. Needs to address "soft" data and non-b/c ratios.
 - b. From bottom-up (e.g., staff to managers to bureau chiefs, etc.)
 - c. Need to coordinate with and understand functions/benefits of Resource Agencies. Also, need to carry (MDT) decisions back to Resource Agencies and provide reasons as to why decisions may have changed from Resource Agency recommendations.
 - d. Need to change MDT culture to incorporate WA as part of design regardless of standards/regulatory status.
 - e. Include Construction & R/W; not just designers and biologists.
5. Planning:
- a. Bio Scan is currently done in Corridor Studies. This only identifies potential wildlife issues. May not address treatments.
6. Design:
- a. WA should occur at or before AGR.
 - b. AGR should identify locations for WA including fencing.
 - c. BRR document overview
 - i. General tool to look at carcass and crash data.
 - ii. Chance to coordinate with FWP.
 - iii. Develop recommendation to be considered in next stages of design for WA.
 - iv. Resulting recommendation often requires significant iterations and (time for coordination) with Resource Agencies'. Timing needs to be addressed/planned out.
 - d. Need separate task for Justification of WA.
 - i. Document must address wildlife needs and recommend locations/treatment
 - ii. Entire design team then uses document to determine feasibility
 - iii. Need documentation before SOW
 - iv. Should include Cost section (see example from Joe on N of Stevensville-N and Paul's from Havre-East. (KLJ has these examples)).
 - v. Design Team should include results from this document and carry forward into design discussions. Results need to be conveyed back also (two-way communication). Design should be finalized by PIH.
 - vi. Consider if justification document should include priorities for WA.

- vii. Consider if justification document can allow options, instead of all or nothing to be addressed during design development. Create a culture that would allow for a compromise between both designers and biologists.
 - e. Design treatment details at PIH.
 - f. Need process (similar to wetland/slope steepening) to justify not meeting desirable design standards to include WA.
 - g. Consistency between Districts is needed. Justification document will help, especially in district new to WA.
7. R/W:
- a. Discussed timing of R/W including landowner discussions typically at late stage.
 - b. Need R/W agent to be educated on WA for landowner discussions.
8. Construction:
- a. Need education as it currently appears that WA are an imposition to the project.
 - b. MDT Construction conference is good education tool.
 - c. Construction not included in design process until bluesheet/special provisions stage.
 - d. Earlier involvement would be helpful.
9. Funding for WA features:
- a. Get WA into nomination process (at District level).
 - i. Districts should consult with Biologist for WA.
 - b. Not sure that separate fund (for statewide application) would be helpful.
10. Past experiences with wildlife accommodations:
- a. Good project examples
 - i. Havre-East
 - ii. N of Stevensville North
 - iii. E of Thompson River East where zap-Crete at fence end treatment is being installed. Discussion with manufacturer and construction/maintenance etc. to ensure the product can be maintained was a benefit.
 - b. Examples not to follow:
 - i. US 93 North where WA were based on more than wildlife needs and design was overdone.
 - ii. Areas in which design treatments are being reduced (jump outs now 5' high; instead of 7').
11. Other:
- a. Resource Agencies (RA):
 - i. Keep RA in the loop on a project during design.
 - ii. RA staff do not typically understand MDT plans and do not see what will be in the field until it's constructed.
 - iii. Consider 3D renderings instead of plans. Especially helpful for USFWS acceptance for T&E species (permit/regulatory).

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Meeting Minutes - Wildlife Accommodations Process

Development



Date: 7/14/2016

Time: 2:30 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Dwane Kailey	MDT - Management	406-444-6414	dkaley@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 14, 2016 at 2:30pm at MDT offices to discuss wildlife accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations Include:
 - a. Crossing structure
 - b. Fencing
 - c. Mitigation features-e.g., limited tree removal w/in the r/w (such as Libby North)
 - d. Habitat restoration
 - e. Habitat mitigation
2. Wildlife data:
 - a. Data is soft data
 - b. Data is similar to Geotech, a sampling with much uncertainty.
 - c. Expect a yes/no decision but that is not always applicable. Need to change design culture/ process to allow iterative development.
 - d. Staff biologists have wildlife knowledge and make a difference if forwarding the WA need/design.
 - e. Engineers need to understand reasoning for WA. This includes education and good explanation and/or justification of WA benefits.
3. Timing of WA decision.
 - a. OT phase should establish wildlife corridor exists. Is a high-level review.
 - i. Should identify if corridor/permeability issues or safety issue. Should commit MDT to consider WA in project.

- ii. Pre-NEPA process develops needs and justification with decision at end. Occurs before project nomination.
- b. Early identification of needs for potential WA. Not at PIH. Needs to be scoped before going to Road Design or Consultant.
 - i. Design details finished between AGR and SOW. Need prioritization for WA for future give-and-take. Compromise in design.
 - ii. Justification needs to address O&M.
- 4. MDT involvement for WA decision:
 - a. Maintenance input, some but not final “no” decision.
 - b. Construction only for constructability issues.
 - c. Enforcement. No specific involvement.
- 5. Consistent WA application:
 - a. Need understanding (by designers of tools)
 - b. Need guidelines not policy?
 - c. No separate funding pool. Part of project development which will identify appropriate costs, etc.
- 6. Past MDT experiences:
 - a. Good/beneficial
 - i. Libby-North, limited tree removal to make corridor more natural/attractive for grizzly crossing.
 - ii. Missoula District regular meeting with Resource Agency (RA). Generally good but need to watch RA balance. Note: Florida DOT use website to get RA input.
 - iii. Sula: negotiated design/RA was appropriate level although inserted at later stage.
 - iv. Lolo-Hamilton WA. County provided partial funding (earmark from Barbara Evans) for county-identified need (and high county priority).
 - v. Clearwater. Crossing was not included as the process identified it was not realistic.
 - vi. Miles City fencing.
 - b. Bad/detrimental
 - i. Pavement mill/fill construction timing was limited by nesting eagles but near an active rail line. Construction limits seems excessive compared to day-to-day noise impacts.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/15/2016

Time: 8:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT;

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Lesly Tribelhorn	MDT		ltribelhorn@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 15, 2016 at 8:00 AM at The Dive Bakery to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Justification:

- a. Design Exceptions Discussion:
 - i. Need solid justification to approve.
 1. Show the wildlife corridor or impact (the Need).
 2. Show results of the proposed project disruption to this wildlife need.
 - ii. MDT will need to accept evidence which is not fully (statistically) based upon the highest c/b ratio.
 - iii. Apply Performance based and practical design
 - iv. Discussed trade-offs (for including the WA and what happens to road safety, maintenance, etc.)
 - v. Document reasonable maximums for the (crossing) design. Balance with entire road design.
- b. Cite research that justifies the need (for WA)
- c. Include maintenance costs (life cycle) for justification.
- d. Document utility or R/W Costs in justification.

2. Decision Timing: WA

a. Nomination Time:

- i. Districts are given budgets for each program. Only a few weeks to finalize.
- ii. District could get Biologist input at this time.

- 1. Consider annual item for Biologist for pre-nomination baseline info.
- iii. Consider a map tool for District to identify level of intensity of wildlife corridors/issues/etc.? Permeability map based upon RA databases plus crash/carcass data?
- ↳
 - b. OT phase corridor study should identify if need exists.
 - c. BRR should be on similar timing to preliminary hydraulics (determine size of bridge openings and crossings but not all pipe sizes).
 - d. PFR bring hydraulics and biologic background data to meeting.
 - e. WA decision by AGR. And should acknowledge Design Exceptions at AGR.
 - i. Need Resource Agency buy-in (not approval) at AGR.
 - 1. Recognize that RA will not give concurrence until final plans. (Why? -discuss this with RA meeting?)
 - 2. Compared to Oregon DOT process for fish passage at bridges, possibly from about 10 years ago.
 - 3. Need to build trust between DOT and RA for installation of WA.
- 3. Design Standard's:
 - a. Need thresholds defined for WA (for engineer culture to incorporate).
 - b. Would help with consistency (among staff and Districts).
 - c. Education for engineers on the needs and the design guidelines/flexibility. MDT is moving to performance based design.
 - i. *Inserted outside of interview: general definition:*
...A project constructed in this way is required to meet certain measurable or predictable performance requirement..., without a specific prescribed method by which to attain those requirements. Such an approach provides the freedom to develop tools and methods to evaluate the entire life cycle of the project process, from the development, through design and construction and the use by both the public and the wildlife impacts/environment.
 - ii. *Safety and operational aspects are known. What about WA? What are measurable benefits to including WA in another context?*
 - iii. *Can proof of benefit to wildlife be included as part of the performance measures?*
- 4. MDT involvement in decisions:
 - a. Construction-to address constructability, possibly at AGR.
 - b. Maintenance:
 - i. Need Section staff (boots on the ground) not supervisor level.

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Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/15/2016

Time: 9:30 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Dustin Rouse	MDT - Management	406-444-6005	drouse@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 15, 2016 at 9:30am at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Mechanism to benefit safe crossings of highway and safety
 - b. Crossings
 - c. Signing
 - d. Electro-mat
 - e. Crash history and currently hearing customer comments about need for WA
2. Decision for WA:
 - a. When: needs to be early
 - i. Before PE, need to indicate if WA are needed in corridor. Exclude projects such as chip-n-seal.
 - b. For PFR report, include:
 - i. Crash data for wildlife hits
 - ii. Biologist review of non-safety data. Need to bring to discussion at this level.
 - iii. Resource Agency (RA) involvement not appropriate at this stage. Need in later decisions addressing feasibility.
3. Decision Documents should include:
 - a. BRR (identify issues and need)
 - b. Typical Milestone report such as PFR, AGR, SOW. PIH is too late.
4. Need for WA:
 - a. MDT priority is safe public roads. Are Montana roads a permeable facility for wildlife?

- b. A Barrier versus an Influence? Need data to justify.
5. Justification.
- Safety benefits are top priority. Based upon crash history (which has good data base).
 - If highway is a barrier:
 - Then recommend WA.
 - Stakeholders:
 - RA
 - Landowner
 - Need concurrence from both. Need continual communication with stakeholders.
 - Is wildlife a tourism benefit in this area (what are data sources to help with this as a data-based decision-not a gut feel)? If so, this may help justification.
 - MDT needs a defendable justification to include/exclude WA. Needs to be based upon science versus balance of safe road delivery (soft versus hard data). May need to include the value of and to wildlife.
6. MDT involvement for decisions:
- Designers and Biologists
 - Construction-likely at PFR. No other involvement until design details
 - Maintenance. Need ownership into the design team and therefore the decisions. Integrate into ownership at the need/justification level (education).
 - Enforcement: What about on land use side of enforcement?
 - R/W or Landowners.
 - Need early coordination on crossings. Is it critical for WA?
 - Desirably, landowner communication should include District R W Supervisor and ESS (or DA).
7. WA Examples:
- Good:
 - I-15 around Dearborn. Added jump outs and wildlife exclusionary fencing to project.
 - Butte District-similar
 - Poor: Mission Interchange. Biologist wanted to retain existing drainage structure (proposed to be replaced). At PFR, was not documented or supported by crash data or carcasses. Private approaches and drifting (due to guardrail) issues were discussed in design and resulted in removing the structures (for road safety and access).

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Meeting Minutes - Wildlife Accommodations Process

Development

Date: 7/15/2016

Time: 1:30 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT; M. Traxler;
J. Davis

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Tom Martin	MDT Helena - Environmental	406-444-0879	tomartin@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on July 15, 2016 at 1:30pm at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include
 - a. Crossings, both large and small. Ungulates are primary concern.
 - i. Roads are not the problem for many species. A problem for T&E species.
 - b. Fencing. Both permeable and exclusionary.
 - i. Fencing as a barrier (e.g., fencing can influence the permeability for antelope as a species).
 - c. Mitigation, Note WAP should not drive the decision for WA.
 - d. Currently, excludes fish or amphibians -but may need to modify in future.
2. Decision:
 - a. Need a different mechanism.
 - b. Need documented and predictable report (within an activity) which address the feasibility and the reasonable issues for the WA.
 - c. BRR currently identifies existing wildlife and crash/safety data. Some use of carcass data-which is inconsistent, soft data. BRR is not read/used by design team.
 - d. No specific Activity or Report currently to define project needs (for WA) and how to accommodate wildlife
 - i. Report should come from Tom's position.

- ii. Should be predecessor to Implementation and feasibility which would be defined by design team with compromise approach.
 - 1. Feasibility should include adjacent land use (for crossings) and for exclusionary fencing.
 - iii. Needs engineering involvement.
- e. Justification Memo (newer process developed by Tom-see examples provided).
 - i. Provides documented process...to get acceptance and consistency and justification.
 - ii. Justifies the data (science).
 - iii. Currently occurs after SOW report. After discussion-this is not good as after SOW affects grade and alignment. Consider alternate Design Memo step, two-part process:
 - 1. Need iterative process with flexibility to compromise.
 - 2. Need to consider WA (formalized at SOW)? Would need preliminary sizing for AGR needs.
 - 3. Justification, between SOW and PIH.
- 3. MDT involvement for decisions:
 - a. Construction: for constructability. Not decision
 - b. Maintenance: input but not decision.
 - c. R/W: input but not decision. Should landowner outreach occur earlier? Possible.
- 4. Timing:
 - a. Currently in MDT's Survey Stage but with definitive action by SOW.
 - b. Project Nomination: Biologist should have knowledge and time to provide data for DA.
 - i. Project are rarely/never nominated due to wildlife safety.
 - c. OT phase
 - i. Should not change project delivery schedule.
 - ii. Corridor studies are high-level view which may not allow for specific identity type of WA but should identify wildlife needs/ issues.
- 5. Education & MDT Culture
 - a. Need to break the thought paradigm that c/b ratio should justify a WA.
 - b. Soft versus Hard data is large issue. Engineers are trained if there is a problem, fix it for the desired benefit. Need hard date to justify the need.
 - c. This should help the application of Core funding toward WA.
 - d. WAP should provide sideboards for reasonableness....
- 6. Design standards: Recognize that design standards for WA are not part of the WAP project. Need iterative process with reasonableness factor.
- 7. Good/beneficial experiences with wildlife accommodations been.

- a. Checkboard to Martinsdale. Two existing bridge crossings were to be removed. WA were desired but 1 planned to be omitted. After Geotech data, project had to go back to a bridge for soils reasons.
 - b. I-15, south of Helena. Lack of elk crossings yet conflict pattern exists.
8. RA involvement:
- a. FWP is good with sharing info. Does not have regulatory role. Involved at BRR stage and then some through design.
 - b. USFWS involved with T&E.
 - i. Need to provide info early and seek input.
 - ii. No buy-in until BA/BO in the current process.
 - iii. Can education show USFWS that late BO is a problem in MDT project delivery?
 - 1. Don't duplicate current regulatory requirements/effort.

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Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/2/2016

Time: 1:00 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Bryan Miller	MDT - Consultant Design	444-9413	brmiller@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on August 2, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - Crossings
 - WFF
 - Context sensitive design solutions (e.g.
 - steeper slopes to shorten culvert length,
 - culvert placed in middle of fill for wildlife passage instead of bottom, etc.
 - WFF at select locations (not entire length or all or nothings approach)
2. Decision for WA:
 - a. When:
 - i. In Scoping/Survey Phase of a project.
 - ii. At/after AGR. Document in SOW report.
 - iii. Does not need to be prior to AGR as grade changes can be made after AGR-in interactive design.
 - b. BRR should identify the wildlife needs.
 - i. Need to address safety data and available wildlife data. Clearly convey wildlife patterns that drive the need to perpetuate a wildlife pattern (migratory, seasonal, daily, mating, etc.)
 - ii. Need to comprehensively define the needs for wildlife (not the WA at this stage but may offer suggestions?).

- iii. Note-Need to avoid the early concept of "we need it (WA) all" with no restrictions.
- iv. Discussed what is value to removing the obstacles for wildlife crossings.
- v. Land Use/ownership should be considered.
 - 1. Forest Services (or other public) ownership outside R/W allows for future un-development of lands.
 - 2. Private lands may be developed-need to consider in selecting WA (for long term situation).
- 3. Decision Documents should include:
 - a. Holistic approach to the recommended WA.
 - b. Iterative process (like many design issues)
 - c. Clearly define the Need for WA.
 - d. Provides clear justification which will then be used to support design exceptions if necessary.
- 4. Past experiences with wildlife accommodations:
 - a. Good/beneficial
 - i. Madison Bridge near Ennis. Left path of grassy area between riprap slope and water which has resulted in allowing wildlife passage under bridge. Unsure of how/why this was developed.
 - ii. Martinsdale project where Forest Service's lands on either side of highway were considered in locating wildlife crossings.
 - b. Bad/detrimental -
 - i. Gallatin River Bridge (?)Why and how to expand detrimental - what didn't work where planned wildlife path under bridge was built in concrete. Now encourages pedestrian usage-not wildlife. Given population growth in area-is likely seeing pedestrian usage.
- 5. Critical process needs (for Wildlife Accommodations) and their priority/ranking? Sample may include:
 - a. Predictability/Consistency: needs upper management support/leadership/
 - b. Other key factors? Include in Scoping (Survey) Phase of a project.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/2/2016

Time: afternoon PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
John Waller	Glacier National Park- Wildlife Biologist	406-888-7829	
Kathy Harris	KLJ	406-441-5784	Kathy.harris@kljeng.com

Agenda Topics

A phone conference was held on August 23, 2016 to discuss Wildlife Accommodations (WA). *Action items are shown in italics.* John clarified that Glacier National Park (GNP) has limited MDT involvement but does have federal lands interaction.

1. Wildlife Accommodations include:
 - a. Crossings
 - b. Fencing
 - c. Signs
 - d. Speed limits
 - e. Special designation roads
2. Past experiences with wildlife accommodations:
 - a. Good/beneficial
 - i. Going to Sun Highway, national historic engineering landmark
 1. Landmark limited what could be done.
 2. Able to upsize road culverts for Wildlife
 3. Fencing -restrictive and other
 - b. Bad/detrimental -
 - i. Engineers streamline (design) for safety and decide with focus on efficiency for road travel
 - ii. Wildlife/WA were not included/not even on the radar. Past 10 years have seen better acknowledgement by engineering profession.
 - iii. Highway 2: Columbia Heights to Badrock Canyon

1. No wildlife crossings in first project. Considered a slaughter zone (for wildlife).
 2. Current project has better understanding of need for WA and crossings and better outreach.
- iv. Highway 89.
3. Data (wildlife science).
 - a. Data is not thorough. Spot efforts occur.
 - b. Wildlife and highway interaction does not have thorough data.
 - c. Note-general data cannot always be applied to all sites. Need site-specific knowledge (such as MDT Staff Biologists who are familiar with region and with site and with proposed project).
4. Environmental Process (Document).
 - a. Formal Consultation process is important and continues through construction activities.
 - b. Enforcement (of wildlife issues). There is enforcement ability during construction (through permitting).

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Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/4/2016

Time: 9:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
David Hedstrom	MDT -Hydraulics	444-7961	dhedstrom@mt.gov
Annette Compton	MDT- Hydraulics	444-5988	ancompton@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on August 4, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Fencing
 - b. Crossings
 - c. Warnings
 - d. R/W changes (such as mowing vegetation or other).
2. Decision for WA:
 - a. When:
 - i. Between PFR and AGR.
 - ii. Needed before PIH.
 - b. Justification:
 - i. Define the need (elk versus bear, etc.)
 - ii. Define feasibility. Scientists need to be reasonable.
 - iii. Educate. Dave noted past field trips with Pat Basting greatly improved his understanding of WAP and wildlife needs.
3. WA:
 - a. Need standards design for different types of wildlife (crossings)? This would help estimate early budgets.
 - b. Timing for WA should be similar to Hydraulics openings which are defined at AGR (as these have large budget effect).

- ↳
- c. Past changes in true "openness" factor of openings (wildlife undercrossings) leads to uncertainty of any definite standards. WA standards would help improve trust between designers and scientists.
 - 4. Discussed hydraulics and integration of fish passage into standard design.
 - a. FHWA developed HEC 26 which developed philosophy, was based upon actual data, and provides a logical process for integration. Includes an openness factor.
 - b. *Discussed MDT Activities 370 which defined needs for openings or 356.*
 - 5. Past experiences with wildlife accommodations been:
 - a. Good/beneficial
 - i. Checkerboard/Martinsdale:
 - 1. Worked with FWP Biologist who focused on Casper Creek as a valuable wildlife corridor. Helped justify the wildlife connectivity at this location and its location/placement. Helped focus on this area.
 - ii. GBRs Bridge-added wildlife path under bridge.
 - b. Bad/detrimental - what didn't work - and why
 - i. Checkerboard/Martinsdale:
 - 1. Decision was late in project. Required re-work
 - 2. May have resulted in overdesign.
 - ii. South of Boulder: separate wildlife crossing very near bridge appear to be redundant.
 - iii. Wildlife crossing-culvert placed in middle of deep fill. Did this really work for wildlife passage-aren't they in the bottom of the drainage, not the middle of the side hill?
 - 6. Other:
 - a. Annette noted the MDT Research Library is quite extensive.
 - b. Dave noted the US 93 South Study by Patty Cramer.

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Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/4/2016

Time: 10:15AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kraig McLeod	MDT- Traffic Safety	444-6256	krmcleod@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on August 4, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Timing Decision for WA:
 - a. PFR through SOW.
 - b. Kraig suggested the safety analysis be present at PFR to try to advance discussion and project development.
 - c. Prefer not as late as SOW.
2. Justification.
 - a. Should be data driven.
 - b. Justification for spending funds on these safety features instead of other safety (or road) features.
 - c. Should not be subjective.
 - d. Should be economically justified.
3. In your position at MDT, what is your professional role with WA:
 - a. Analysis (Traffic Safety)
 - i. Provide data and analysis of vehicular crashes.
 - ii. This section also enters carcass data-but does not maintain or analyze. Can generate GIS map if requested by Biologist.
 - b. Traffic safety analysis is provided for each engineered project. Typically, signage (to warn of wildlife) is the recommendation. Note-wildlife warning signing is applied in specific locations and limit length to 4-5 miles (not 20+).
4. WA experiences

- a. Good/beneficial: I-90, Drummond. Trying to use/modify existing undercrossings & add fencing. Working with FWP and landowners to channel wildlife. This has long-been recognized as a safety area.
 - b. Bad/detrimental: - I-15, Boulder to Helena. Identified safety issue (elk) but area is too broad to exclude elk to only few locations. Still being studied.
- ↳ 5. Other: Rumble strip committee provides a critical thought/decision making body for consistent application across the state.
- a. MDT has standard policy. (rural rumble strip policy).
 - b. When threshold is outside the policy, designer can make recommendation to Committee for application outside standards.
 - c. Recommendation should be
 - i. Economical justified
 - ii. Acknowledge level of reasonableness
 - d. Committee allows for good critical thought, reasonable exceptions or not. The committee tempers the outcome to provide consistency
 - e. Members are: Roy P, Kraig, Lesly T, Sheila Ludlow, or Michelle Erb (bike-pedestrian coordinators) and then the Design Team Member varies-based upon the specific request being considered.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/4/2016
Time: 3:00 PM

Facilitator: Kathy Harris
CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Shane Mintz	MDT - Glendive District Admin	406-345-8212	smintz@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A phone call was held on August 2, 2016 to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. Fencing
 - c. Capping of steel posts to restrict birds entering the posts (fencing or delineation?)
2. When WA should be determined:
 - a. Need discussion at PFR.
 - b. WA should not add time to the project delivery (incorporate into existing schedule)
3. What is needed for justifications (of WA):
 - a. Justification needs to be solid because spending funds here result in not improving another public road.
 - b. Additional costs for WA need to be reasonable. Need to show resulting benefits to both safety and to wildlife
 - c. Safety costs may not meet "standard" benefits.
 - i. MT 200 has low vehicular volumes, so low crash numbers and any WA seems not to justify in b/c but if it's small cost to the project, and will be used for 50 years-it's a good inclusion. Need the moderations here (small pipe upsize not independent, structure). were questioned.
4. In your position at MDT, what is your professional role with Wildlife Accommodations development (strive to determine difference from evaluating feasibility and recommendation of features):

- ↳
- a. Analysis Safety records are used typically and are good
 - b. Planning:
 - i. Corridor studies may address the wildlife needs.
 - ii. Are getting some comments on STIP projects (for wildlife safety).
Montanans for Safety Wildlife Passage, National Park Conservation Association.
 - c. Design: MDT Biologists provide scientific knowledge.
 - d. Maintenance: Communication could be improved in this area (both explaining and listening).
5. Past experiences with wildlife accommodations been?
- a. Good/beneficial
 - i. Early notification to FWP of R/W acquisitions process. Invite FWP along (with R/W visits) to discuss benefits of WFF. No actual participation but seeking to develop more of a partnership.
 - ii. FWP meetings in District (both south and north of district) to update on MDT projects. Dates, type of projects, etc.
 - iii. Highway MT 200 replacing timber bridges (many over number of years). Suggestion to upsize pipe for WA when replacing original bridge has minimal costs but some resistance in District (from design staff?).
 - iv. US 2 Antelope Signing.
 - 1. Provided signing (hinged and or flashing warning) signs when migratory patterns. Was suggested by FWP and FWP will actually change the signs for the appropriate migration times. FWP has investment (due to maintenance).
 - v. Maintenance involvement in WFF between Glendive and Miles City due to deer/antelope carcass. Used safety funds.
 - b. Bad/detrimental - what didn't work - and why
 - i. Interstate fencing. Added ½ mile exclusionary fence using existing underpass/stock passes etc. Results were wildlife were funneled into alfalfa field. Landowner was irate.
 - ii. Suggestion to add WFF on all interstates. This is blanket solution and would totally change current patterns (for antelope) on a major scale. Note-the interstates have impacted antelope permeability for last 50 years-so change from current fencing could have species impact.
 - iii. Biologists located in Helena means less interaction with District staff.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/8/2016

Time: 7:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Mike McGrath	USFWS	449-5225 x 201	mike_mcgrath@fws.gov
Mark Traxler	RESPEC		Mark.Traxler@respec.com
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on August 8, 2016 at Dive Bakery to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. WFF
 - c. Others.
2. Interaction with various levels of MDT for WA:
 - a. PE-most interaction currently. This may shift toward more maintenance coordination.
 - i. PE through consultation meetings.
 - ii. PE-through “re-initiation clause” Note: USFWS uses the best available science (per ESA).
 - iii. PE-permitting. This is very late (in MDT project delivery) if previous interaction has not happened.
 - iv. Recent slide repairs are considered emergency projects but should have regular planning due to MDT project durations.
 - v. Bridge possible location for bat roosts
 - b. Construction: pile driving activities affect fish-can be a take of fish.
 - c. Maintenance
 - i. Mowing (which affect ground birds)
 - ii. Transition of future conservation areas or wetland banks, etc.

3. WA Examples:
- Good: US 93 North. Developed design with wildlife measures.
 - Poor: Kiowa-N&S. Bridges were planned and should be sized for grizzly crossings as a conservation measure. 2008 EIS stated MDT would consult with Blackfeet & USFWS. Consultation did not occur in timely manner-not until final bridge plans were presented to RA. The bridges did not use current science (FHWA Wildlife Recommendation for 2011).
4. What criteria/factors should be included for determining Need:
- Need to define the value of wildlife and environment. Its appreciation helps define Montana and may not have a definable number but still has value.
 - Data. Carcass data may not be unified (data collected I not statistically valid) but has value.
5. Critical timing needs (for Wildlife Accommodations):
- May vary between reservation and off-reservation projects.
 - TSL report should be sent to Consultation Agency to balance with other resource mitigation. Critical step for opening sizing.
 - Beneficial to have Interagency Meeting (all resource agencies) for field visit for projects. Between PRF and AGR. Challenge for staffing, but when all agencies previously attended field workshop over a few days there were good results. The field visits allowed comprehensive development of needs in the field along with a balance of the engineering design. This allowed RA to offer early buy-in.
 - Corridor Study agency meeting provides an early opportunity. Not all agencies are taking advantage of this opportunity. At a minimum, these should include what is wildlife mortality (helps define need).
6. MDT is the most-impactive entity to wildlife (outside of management agencies). Both RA and MDT engineers need to recognize this, so that "permitting" or T&E does not trigger the need for WA-rather it is recognized part of project need.
7. Linkage zone studies have been done (by WTI and others). Not sure where info resides but appears MDT Biologist do use this as a data source. Not likely a GIS map.
8. STIP comments and Tranplan meeting. Agencies have offered comments.
9. Other possible contacts:
- Renee Lemon, Land Use Planner from FWP was advocating more agency involvement.
 - Jonathan Ferree, new FWP SPA coordinator
 - Beau Downing has extensive past MDT knowledge but is now with DEQ.
 - Jeff Ryan has past MDT knowledge but is now retired from DEQ.
 - Renee Callahan, Wildlife Overpass NGO from Bozeman area.

File: 4215002, Meeting

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/17/2016

Time: 8:30 AM

Attending:

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Name	Company/ Organization	Phone Number	E-Mail
Jessy Coltrane	FWP-Area Biologist Kalispell		jcoltrane@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on August 17, 2016 at FWP Kalispell office to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Fencing
 - b. Crossings
 - c. Lighting
 - d. Strategy
 - e. Mitigation (past experience in Alaska with mitigation)
2. Jessy noted two wildlife impacts from roads:
 - a. Collisions (public safety on existing roads). Typically focus on larger animals/ungulates.
 - b. New and Expanded roads remove habitat and connectivity for migratory, seasonal, etc. More data is needed for the road impact on wildlife. Feels DOT should be developing these data (especially in NW Montana) as the roads are such a large impact.
3. Timing of WA decisions:
 - a. At Technical Advisory Phase (not an MDT phase) which is sometime after funding is established (for project).
 - b. Early involvement allows for data collection which allow for good decisions. Can we support this (to study and determine wildlife needs before road impacts)?
4. Discussion with FWP (suggestions):
 - a. Communication for MDT project:
 - i. Early, initial email to wildlife manager in the correct region (of 5 FWP regions).
 - ii. Wildlife manager then distribute to appropriate FWP staff which likely include area biologist, non-game biologist and/or aquatic.

- ↳
- b. Note-early contact may allow for funding for FWP data collection:
 - i. Perhaps opportunity for wildlife data collection as part of collaborative-agency effort and potential to seek/find non-transportation funds.
 - ii. Is there opportunity for research funds (both transportation and non-) for this data?
 - c. Need to educate/recognize that wildlife behavior takes time to adapt. Ungulates are generational.
 - d. Cumulative impacts should be recognized, multiple roads become cumulative barriers.
5. Design standards are challenging and currently not available, as they vary per species. Recommend use of general openness ratio (for crossings).
- a. Florida and Arizona have developed application/standards for small culvert passage of small animal at minimal cost.
 - b. Note-icing (that may affect usage by wildlife) needs to be considered at culvert crossings. Especially crossings that also allow water to cross the roadway.
6. FWP Data:
- a. FWP has habitat selection models (spatial).
 - b. Resource selection models require tracking animals (data) for development of the model.
7. Past WA experiences:
- a. Good/beneficial
 - i. Increase bridge opening for wildlife crossings. Integrated input from Biologist and Engineering to develop a compromise design.
 - ii. Thompson Falls where signage was added to a rockfall project.
 - b. Bad/detrimental -
 - i. Alaska high-speed road was adding off ramps, introducing median (short) fence (presumably for vehicle access control) and increasing travel speeds in moose area. Increased speed limits were not based upon environmental conditions. Vehicle safety may have been worsened due to channelizing moose toward intersections-where multiple traffic movements occur. Project disrupted moose connectivity and did not add crossings and resulted in higher speeds and moose directed to intersections. Biologists predicted the safety problems but engineers (appeared to) assume that wildlife would change behavior. Lighting was added to increase visibility for drivers.
 - ii. Note-may need education of RA on setting of speed limits-legal requirements, etc.
8. Note-FWP is in strategic mission-planning effort (see separate document Vision & Guide for FWP) to recognize that the missions of beyond hunting (large amount of funding generated) but also parks and recreation.

File: 4215002, Meeting

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/18/2016

Time: 10:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

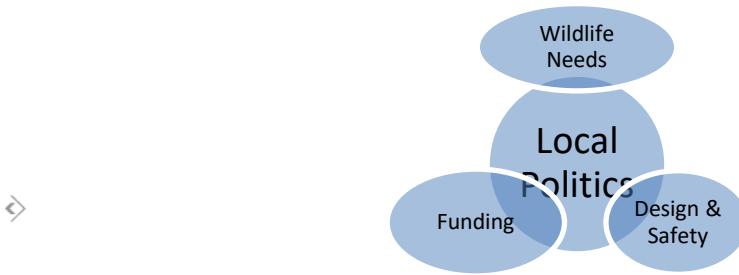
Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	Kathy.harris@kljeng.com
Carol Strizich	MDT- Transportation Planning	444-9240	cstrizich@mt.gov
Charity Watt	MDT - Transportation Planning	444-3439	cwatt@mt.gov

Agenda Topics

A meeting was held on August 18, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. Connectivity (for wildlife)
 - c. Signing/warning treatments. VMS or presence detection
 - d. research
2. Limited previous experiences with WA:
 - a. MT 1 near Anaconda, seemed beneficial,
 - b. Possibly Libby, seemed beneficial
 - c. Paradise Valley. Land use and landowner cooperation were needed due to MDT's limited jurisdiction. Consider that land use should be part of WA justification.
3. Need for WA:
 - a. Need and justification are needed. How do we measure the need?
 - b. Balance treatments minimum versus Cadillac.
 - c. 3-way balance between:



4. In your position at MDT, what is your professional role with Wildlife Accommodations development:
 - a. Planning
 - i. Tranplan: statewide policy. Statewide policy update ongoing-draft in 2016 with adoption in spring 2017. (see attachment).
 - ii. Corridor Studies:
 1. Should identify presence and wildlife concerns
 2. Public involvement-allows RA coordination
 3. Safety/Crash Data. Recognize that crashes are under-represented and rely upon self-reporting for damage over \$2000. Carcass database-does it have any threshold?
 4. Study could include WA recommendations if warranted. Need to consider 3-way balance (above).
 - b. Design: (Planning) Involvement is typically for funding or scope changes. No design details.
 - c. Funding: Planning does the programming function.
 5. Criteria/factors should be included for WA (limited to Corridor Studies):
 - a. Document the need
 - b. Feasibility should address constructability and fundability. Corridor study may not screen out (WA) but consider needs and possible options (for future consideration) to meet wildlife needs
 - c. Document should be within an Activity. Ensure consistency.
 - d. Discussed if public input should be part of the (wildlife) need development.
 6. Other:
 - a. MDT is doing due diligence for wildlife.
 - b. Low Vehicle Risk and land use changes are factors that will widely vary for WA import.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/18/2016

Time: 1:30 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT



Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	Kathy.harris@kljeng.com
Jimmie Combs	MDT - Helena Highways	444-6244	jcombs@mt.gov

Agenda Topics

A meeting was held on August 18, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. Fencing
 - c. Issues/Items within the Clear Zone
 - d. Experimental Features are being considered but no specific knowledge
2. Timing of Decision for WA:
 - a. By SOW, definitely before PIH. Project can be redefined at SOW but should stay within the scale of (the type of) project. (e.g., minor reconstruction, P-P or total reconstruct with capacity added).
 - b. Consider BRR report for the biology/wildlife need.
 - c. AGR Report should define the profile which implies crossings need to be determined and confirmed.
 - d. Pre-AGR is challenging but WAP process should help vet this out during early design stage. Especially the profile and the road sections.
3. Justification.
 - a. Need clear justification of wildlife needs and type of WA.
 - b. Need to balance WA with safety and be reasonable within scope/scale of project (e.g., Reconstruction w/o R/W should not readily include WA outside of R/W). Type of project (reconstruction with capacity versus PP) should impact WA recommendations.
 - c. Need continuing education of engineers/design team to understand.

- d. Suggest the request for WA originates with the Biologist defining wildlife needs and options to meet those needs for the specific project.
 - e. WA decision should address competing resources (e.g. funding, conversion of wetlands versus terrestrial benefits, etc.).
 - f. There should be a reasonable effort to discuss if this (WA or project) has sustainable land uses (outside the highway R/W).
- 4. WA Decision.
 - a. Decisions should be consensus between design team including biologists and preconstruction engineer. If needed, resolution (of WA) may rise to the DA or other level.
 - b. Document decisions in milestone documents.
 - c. Design Exception for WA would need crash/safety analysis which supports the feature. Other tools (such as b/c ratios) are also valuable.
- 5. Good MDT examples: when existing or planned bridges cooperatively engage biologists to incorporate the wildlife need into design.
- 6. Bad MDT example: Minimal experience but due to poor timing for WA inclusion.
- 7. Other:
 - a. Consider including R/W agent when land owner involvement may affect WA, especially WFF. This may already be addressed in MDT processes.
 - b. Design note. For exclusionary fencing, suggest including WA in design process (to get DCE and DA awareness) and inclusion of landowner, (e.g. ranchers with calving pasture versus WFF).

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/18/2016

Time: 4:00 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	Kathy.harris@kljeng.com
Scott Helm	MDT - Helena Geotechnical	444-6279	shelm@mt.gov

Agenda Topics

A meeting was held on August 18, 2016 offsite to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. Jump outs
 - c. Pathway under bridges
 - d. Larger bridge opening
 - e. Fish passage treatments
2. Need for WA:
 - a. Need clear problem definition and the recommended solution. Also, options to that solution-which can be developed as part of the design effort. Should reflect permitting needs.
 - b. Similarly-when addressing permitting, define WA need and then present all options.
 - c. Cost (relative) should be addressed here.
3. Justification.
 - a. Due to limited funding, MDT projects need to spend most effectively. Safety has a great benefit to humans.
 - b. Discussed Geotech/rock falls-where safety and constructability (for clearing road) are relevant.
 - i. Have developed a "heat map" to show GIS layers about hot areas.
 - ii. Rockfall occurrences
 - iii. Maintenance Costs.

4. Timing:
- a. Geotech involvement with WA, specifically crossings:
 - i. Pre AGR-the Activity 460 (no drilling) versus 455 (optional drilling). Consider could this activity be used early on to collect early data in select locations (for WA)? Drilling may provide preliminary info that excludes or focuses efforts into a better physical area.
 - ii. @ PFR-need to consider drilling needs for possible crossings. Implies that crossing locations and need to be presented at PFR.
5. Decision Documentation:
- a. PFR Report should document potential for WA...to start the discussion.
 - b. PFR could identify the possible need, so that subsequent efforts will define need more clearly to circle back to see if WA is justified.
 - c. Identify conflicts between functional units so that subsequent efforts can work to resolve.
 - d. (Crossing) Decision needed before AGR-to avoid "stepping backwards" after AGR.
 - e. SOW Report can document decisions for inclusion/exclusion of WA.
 - f. Confirmed that design is iterative and team process.
6. Other:
- a. Does BRR document the conflict and need for WA?
 - b. Need baseline to compare (for WA).
 - c. Regulatory versus regional (or personal) preference may not be clear. Does not build consensus when wildlife data/need is inconsistent and variable.
 - d. Is some education of the regulatory agencies needed? (on highway funding, goals, etc.)
 - e. During iterative design process, engineers need better understanding of WA but biologists need better understanding of details to protect the infrastructure investment.
 - f. MDT Geotech and Bridge have developed suggestions for process improvements. Scott will send separate documentation.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/19/2016

Time: 9:15 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	406-441-5784	kathy.harris@kljeng.com
Gary Neville	MDT - Billings ESS	406-657-0232	gnevile@mt.gov

Agenda Topics

A phone meeting was held on August 19, 2016 to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. WFF is being applied and starting to be sought by landowners.
2. Timing Decision for WA:
 - a. PFR. Should discuss at initial scope/site visit. Currently appears that WA are crash/carcass driven. Not consistent discussion (can be hit or miss) at this level.
 - i. Biologist should attend the PFR and bring background to the meeting for a more-productive discussion. Bring sufficient info, possibly RA contact/support/concern.
 - ii. Decision at PRF can recommend more research-especially for a crossing.
3. Justification for WA:
 - a. WA need analysis with costs and justification.
4. WA Decision: team decision with PM and designer and biologist. Need to seek compromise that results in team consensus and incorporates appropriate WA moving forward.
5. WA development roles:
 - a. Safety Analysis: is data ok and is there more available? MDT Safety typically provides thorough data (which is limited to the recorded incidents).
 - b. Planning: Unsure if Wildlife is addressed.
 - c. Design includes many functional areas:
 - i. Hydraulics

- ii. Biologists
 - iii. Designers
 - d. Maintenance - suggest discussions with maintenance.
6. Justification needed for Design exceptions:
- a. Justify crash benefit to mitigate a defined need.
 - b. Justification may include general references (not hard data).
 - c. Defined mitigation may also help explain to R/W landowners. (during negotiations)
7. MDT Needs:
- a. Predictability and consistency.
 - i. MDT is data driven and the WA may not provide all the data?
 - ii. For consistency, include discussion at PFR level. Make this a step/defined process so it doesn't get omitted/missed.
 - b. Documentation:
 - i. Need crash history
 - ii. Include discussion with MDT Maintenance/with field personnel.
 - iii. Modify PFR report template to ask the question (WA).
8. Other:
- a. Public Involvement.
 - i. Be prepared to discuss WA.
 - ii. Consider adding an answer about "animal exposure".

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/22/2016

Time: 10:30 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Scott Jackson	National Carnivore Program, USFS	406-329-3664 Cell# 406-552-2934	Sjackson03@fs.fed.us
Tammy Fletcher	Wildlife Program Leader, USFS	406-329-3086	tammyfletcher@fs.fed.us
Mark Traxler	Senior Wildlife Biologist	406-502-1881	Mark.Traxler@respec.com
Bill Semmens	MDT - Helena Environmental	406-444-7227	bsememens@mt.gov
Kathy Harris	KLJ	406-441-5784	Kathy.harris@kljeng.com

Agenda Topics

A phone conference was held on August 22, 2016 to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings - overpasses and underpasses
 - b. Culverts and aquatic accommodations
 - c. Fencing
 - d. Signs
 - e. Speed limits
 - f. Special designation roads
 - g. Mitigation or minimizing of road footprint impacts
 - h. Education-such as carnivore class with highway crossings discussion.
2. Past experiences with wildlife accommodations:

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- a. Good - when MDT Biologists contact FS biologist/fishery staff on projects. This typically occurs around the BRR with follow up continuing in various ways (depending upon project needs/type).
 - b. Bad/detrimental - (note-these reflect federal lands, forest highway or other than MDT issues as well as MDT).
 - i. Idaho DOT. WA were too late in design discussions so WA were excluded. However, wildlife needs were identified and then were forwarded for research (moose and grizzly).
 - ii. Engineers streamline (design) for safety and decide with focus on efficiency for road travel
 - iii. Forest Service often brought in too late in the process to provide useful data and information on specific projects.
 - iv. Wildlife/WA were not included/not even on the radar. Past 10 years have seen better acknowledgement by engineering profession.
3. Discussion:
- a. Tammy emphasized "Early and Often" coordination as the best way for the Forest Service to stay engaged and provide input into MDT's project development
 - b. Regarding coordination with USFS, Tammy suggested that all contacts go through her as the regional Wildlife Program Manager and she would point MDT in the right direction as to who they should be talking to on specific projects.
 - c. Scott also suggested the FS Regional Fisheries Manager should be contacted when aquatic "issues" are associated with projects.
 - d. The Forest Service looks at connectivity across the landscape scale and so they wish to be contacted "early and often" when a new project is proposed near USFS land not just when a road specifically bisects Forest Service land.
 - e. The Forest Service would be interested in attending the periodic regional meetings that MDT schedules with Montana FWP to discuss upcoming projects in each region.
 - f. Tammy is working with Bill Rudgor (?) on collecting information (carnivores and large species). The data is not currently centrally located or available for Forest Plans. Best effort to contact Tammy when compilation effort is done.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/23/2016

Time: 8:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	406-441-5784	kathy.harris@kljeng.com
Rob Stapley	MDT - R/W	406-444-6063	rostapley@mt.gov

Agenda Topics

A meeting was held on August 23, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. WFF which require landowner education on what the WFF does (& does not do)
2. Timing Decision for WA: Consider at AGR for fencing. No other timing comments.
3. Decision Documents should include general milestone reports (AGR, SOW).
4. Justification for WA:
 - a. Safety should drive justification of crossings.
 - b. Recognize wildlife patterns (crashes, scat, local knowledge). MDT Biologists have this knowledge.
 - c. Crossings are the usual treatment for a known issue.
5. Land Use:
 - a. Need FHWA leadership on how to proceed.
 - b. Can (MDT) purchase a "right" to protect future wildlife usage? Would FHWA see value for paying for rights which are not solely used for highway purposes?
6. Other:
 - a. MDT's Vision Zero can only be achieved by recognizing outside the roadway-which includes WA.
 - b. Currently working with FHWA to remove (unused) stock crossings-but are they also used by wildlife?

- i. Working to perpetuate or remove based upon land use but the nature of the industry (along public roads) has changed. Historically, a single land owner had pastures that were bisected by a road-now the land ownership and the use (grazing and moving by vehicle, etc.) have changed.
- c. How do stock/wildlife crossings get impacted by change of land ownership?



File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/24/2016

Time: 9:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
Chris Hardan	MDT - Missoula Bridge	444-9221	chardan@mt.gov
Nathan Haddick	MTD - Butte Bridge	444-9400	nhaddick@mt.gov

Agenda Topics

A meeting was held on August 24, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossing structures
 - b. Fencing
 - c. Habitat treatments
2. Timing of Decision for WA. See discussion below. Note that when a project type is selected (at Project Nomination), this dictates how much Bridge involvement there is in project, including PFR participation.
3. Past experiences with wildlife accommodations:
 - a. Good/beneficial
 - i. Use of GRS-IBS on Boulder South.
 1. <https://www.fhwa.dot.gov/innovation/everydaycounts/edc-3/grs-ibs.cfm>
 2. Biologist suggested a wildlife crossing as early as PFR.
 3. Safety data supported
 4. Topography was favorable for crossings.
 5. Unsure if TSL was completed.
 - ii. East of Thompson River East
 1. No TSL was done for crossing.
 2. Crossing was included from inception. Confirmed at AGR.

3. Justified by: safety data & known crash issues and known wildlife (sheep) presence.
4. Opening (size of crossing) was iterative in design based upon road designer, bridge designer, and biologist. More discussion was required because of lack of wildlife design standards (may be good). Perception is that wildlife always needs bigger (opening) but is not supported by hard research/standards.
- b. Bad/detrimental -
- i. Mission Interchange North.
 - 1. Decision was NOT made at AGR and was not a comprehensive design team decision.
 - 2. Decision was made at R/W ("Negotiation) stage which is too late.
4. Other process discussion:
- a. Predictability/Consistency;
 - i. Need support/direction from higher level (at MDT).
 - ii. Need guidance or design memo.
 - iii. Need list of WA issues to consider (guidance memo?) for Project Manager and for design team. Then allow for judgment and compromise from entire design team (engineers and scientists) to iteratively develop project design.
 - b. Design exception justification: (needs consistent application for WA).
 - i. Discuss standards versus crash data. Crash data should look at big picture.
 - ii. Guidance is preferred over standards.
 - c. WA Design process:
 - i. Treat similar to hydraulics for sizing bridge opening. Seek same input from biologist as from District Hydraulics staff (e.g., determine need for hydraulic opening for stream & freeboard which sets bridge parameters).
 - ii. Consider the 370 Activity for bridge opening which uses a checklist for possible WA checklist.
 - iii. Note: At PFR, bridge staff may not attend if not bridges are not planned in project. How to get interaction for WA structures?
 - iv. 706 BRR Activity.
 - 1. Decisions for WA which occurs well before AGR. And design team discussions should be occurring before then.
 - 2. Bridge needs height, grade, and clearance (opening size) for their next steps.
 - 3. District ESS should be involved.
 - 4. At AGR-there is ability to check slopes at crossing and other parameters.
 - d. Suggested MDT Flow Charts to be reviewed for WA changes:
 - i. Bridge Replacement
 - ii. Bridge with Road Design

File: 4215002, Meeting

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/24/2016

Time: 10:15 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	406-441-5784	Kathy.harris@kljeng.com
Kevin Christensen	MDT Construction	406-444-6008	kchristensen@mt.gov

Agenda Topics

A meeting was held on August 24, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Timing (restriction) in construction.
 - i. Bird restrictions
 - ii. Migratory Birds-law seems to be consistently applied and is becoming known across functional areas.
 - b. Clearing & grubbing
 - c. Bull trout restrictions
 - d. Future:
 - i. Noise restriction. E.g. pile driving in water bodies
 - ii. Sage grouse (LUC)
 - iii. Agency restriction for noise disturbance
2. WA Examples (relate to construction limitations):
 - a. Poor:
 - i. Madison chip seal project. Wildlife restrictions required brooming only-why?
 - ii. Troy/Libby. Eagle nest presence limited construction activities. Is this needed when a heavily-used train track lies in the project area?
 - iii. Blaine Springs Bridge replacement. A bio-engineered bridge embankment versus a standard bridge abutment created geotechnical problems. (May have been the addition of streambank treatments into the bio-engineered bank abutment-implies education needed on both sides.)

3. Concerns (that WAP may need to address):
- a. What are top limits for application (of construction restrictions or actual design treatment)? Where is balance of WA with public safety/public funding?
 - b. Restrictions (construction specials) applied without justification and without balance of understanding impacts to the project construction/funds/etc. not consistent.
 - c. Are environmental restrictions based upon regulatory requirements or general feel? (Where is science behind the actual specification restriction?)
 - d. Construction limits for stations/seasons/time-of-day have big impacts on the method of construction. Need to clearly justify when/why they are needed and develop limits with a compromise balance.
 - e. Need education/communication between Environmental and Construction. Consider a Task Force for education/understanding.
4. MDT Design process:
- a. Milestone Dates need to be met-these should be a hard deadline and not subject to changes after that milestone. (Note-upcoming MDT (internal) memorandum on the need to return from previous era of Director-driven deadline changes and meet milestone dates-period.). No changes after Final Plan Review. This is a design-team, culture change so that individual tweaks don't get introduced without team review/acceptance and acknowledgement of effects.
 - b. Use milestone reports for WA need/justification/compromise/decision.
 - c. WA decisions should be made at AGR.
 - d. WA (including construction restrictions/specs) should be by design team-not a single functional area. If no resolution by team; resolution should be made at Lesly or Dustin level.
 - e. PFR should have comprehensive discussion of wildlife and other issues. Staff should come to this meeting prepared and investigate/research prior to meeting as needed to bring issues to bear.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/24/2016

Time: 2:45 PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
Susan Lenard	MDT - Biologist Billings District	444-0845	slenard@mt.gov

Agenda Topics

A meeting was held on August 24, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Fish passage
 - b. Pathway under bridge
 - c. Crossings
 - d. Construction Timing for vegetation, birds, bats, bridge work, etc.
 - e. Need a protocol for bat treatment under bridges.
2. Decision Timing:
 - a. @ PFR, design team needs to know project limits (e.g., length, location and what the construction is).
 - b. Local drainages (terrestrial animal crossings)
 - c. Wildlife movements
 - i. Crash trends
 - ii. Carcass data
 - iii. Bird data
 - iv. Eagles nests
 - v. Other "hot" areas
 - d. Fish species of concern
 - e. SPA
 - f. @ PFR, sometimes design team already has mindset on WA (or lack of). Can be difficult to insert into design if preconceptions. Does this need to move before PFR?

3. Decisions documents should include:
 - a. Consistency.
 - b. Acknowledgements of T&E species for the project.
 - c. (possible?) Acknowledgement of land use to protect possible investment (of WA).
 - d. Construction changes should be relayed back to the design team, especially regarding WA or timing restrictions.
4. Need & Justification for WA:
 - a. Acknowledgement of changing patterns of wildlife, weather, development, hunting, migratory, etc.
5. Role with Wildlife Accommodations development comments:
 - a. MDT Culture changes are needed to fully integrate into design.
 - b. It appears it is easier to direct a consultant to change an AGR design than to get an MDT-design project to change.
 - c. Physical location (with biologists located outside Design Team) can divide design team.
 - d. R/W training is needed to help educate/understand items such as WFF that are finalized in the R/W negotiations stage.
 - e. Proactive efforts are needed to continue education/knowledge.
6. Past MDT experiences with wildlife accommodations:
 - a. Good/beneficial
 - i. New bridge project. When stream bank shifted and MDT needed to replace/move the bridge. Was able to get RA into the field and confirm that MDT would need a new bridge over the new stream location. This was done early on.
 - b. Bad/detrimental -
 - i. Musselshell River erosion on banks is starting to impact R/W fence. Consultant (Confluence) recommendations were not well coordinated with design team. Hydraulics and Geotech had lack of involvement with the plans; resulting in incomplete submittal to RA. Communication and thoroughness appear to need improvements. And possibly the RA did not recall their input and commitments. Seek out a better way to document RA comments during field meeting and other.
7. Resource Agency comments:
 - a. FWP Regulatory branch (stream & banks) but also the Biological Branch (help to define wildlife needs).
 - b. Consider a better way to document RA comments during design interaction.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/25/2016

Time: 10:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
Larry Sickerson	MDT-Biologist Glendive District	444-0462	lsickerson@mt.gov

Agenda Topics

A meeting was held on August 25, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Aquatic & Terrestrial animal passing's
 - b. WFF, still a challenge in Glendive District (for land owner acceptance which may reflect upon landowners or R/W Agents)
2. Past experiences with wildlife accommodations include:
 - a. Good and bad: I-94 Deer Fencing.
 - i. Reduced Animal-Vehicle (AV) crashes, a safety issue.
 - ii. Exclusionary fencing was reduced from 40 to 12 miles in areas of greatest applicability.
 - iii. No additional crossings were installed so wildlife (deer) had to travel longer distances-unlikely to "work with the natural environment".
 - iv. One crossing was blocked by a land owner (after project).
 - b. Detrimental: Replacing older bridges that no longer meet design standards with culverts are less costly and available). No inclusion for wildlife considerations in culvert.
 - c. Challenge-Design staff needs to incorporate biological input and cultivate a respect for this expertise in the design process. Construction also needs to understand biological expertise.
3. WA decisions-Timing.

- a. WA influences project budget so if project is nominated with no understanding (of WA needs) then the inclusion is always considered an add-on... seemingly with lesser priority.
 - b. STIP also sets projects without WA knowledge (for individual projects). This is a critical step.
- ↳ 4. Critical process needs (for Wildlife Accommodations):
- a. Analysis (Traffic Safety). Supplier of crash and carcass data. Does not address that this data is not complete (especially for wildlife impacts). Roads influence other wildlife areas than solely crash/carcass but this is not typically reflected with same weight in design decisions.
 - b. Planning.
 - i. WA (due to budget) should be addressed at the STIP level. Note that due to lower traffic volumes-this District has difficulty justifying any increases, especially WA.
 - ii. Corridor Study should have WA noted and then be carried forward into STIP so that WA are not considered an add-on to the project.
 - c. Design.
 - i. Hydraulics is now recognizing the need for aquatic passage as standard practice. Similarly, other functional areas need to respect the science for WA. This is a culture shift.
 - ii. Challenge areas in design include: low traffic volumes and landowners who are very traditional (non-wildlife friendly).
 - d. Maintenance provides strong knowledge of wildlife conditions on the roads. Biologists should develop relationship with the boots-on-the-ground staff to garner their knowledge of what wildlife is doing. Also, good interaction with FWP biologists to get the boot-on-the-ground understanding.
 - e. Level of MDT Support. Need from highest level. Note that RA provides credibility to MDT biologist recommendations.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/25/2016

Time: 3:00 PM

Attending:

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
Quentin Kujala	FWP-Wildlife Bureau Coordinator	444-5672	gkujala@mt.gov

Agenda Topics

A meeting was held on August 24, 2016 at FWP Helena Office to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Quentin explained his role at FWP to bridge between Bureaus at FWP and encourage relationships, collaboration, and advocacy. No further interaction with FWP Enforcement is needed for this WAP.
 - a. Quentin could provide a single point of contact, if needed, for distributing info, etc.
2. Wildlife Accommodations include:
 - a. WFF
 - b. Similar efforts to be wildlife friendly (such as accommodation of two sheep herds in NW part of state; Anaconda & Thompson River)
 - c. Crossings.
3. Past experiences with (MDT) wildlife accommodations include:
 - a. Good/beneficial
 - i. Mill Creek Highway going to Big Hole where road was relocated outside a stream bottom onto the hillside. Collaborative effort where FWP input was engaged and reflected in the final design. This was supported by a long history of interagency communication concerning the desire to move the road out of the stream bottom.
 - ii. I-15 Fencing around Dearborn area. Exclusionary fencing was added to an area with existing undercrossings that used natural animal routes.
4. Agency Interaction:
 - a. Need to engage local FWP specialists.

- b. Encourage relationship between MDT and FWP with continued communication and interaction. Noted that conferences are a beneficial area to gain/develop the interaction.
 - c. Frequently, an MDT action will catalyze FWP efforts for population issues or migration corridors (note these may be available with the GIS/spatial layers from FWP such as CABS-FWP database available on FWP website).
 - d. Interaction between FWP and the MDT Biologist will help establish need for WA.
 - e. Discussed Interagency Meetings (MDT-hosted).
 - i. Helpful
 - ii. FWP is geographic based.
 - iii. Specific project needs single point of contact. This may allow FWP to provide advance information or research for specific project based with on data in hand or ability to collect field data (if the need is communicated).
 - f. FWP does have annual meeting with sister agencies to keep knowledge flowing.
 - g. Separate unit out of FWP Director's office is the Responsive Management Unit (RMU). Not sure this is correct-but may be a supporting unit.
5. Design Standards: Standard are evolving. MDT can provide support/data to MDT Biologists. Can possibly address additional or specific questions by seeking research. This is based upon collaboration and communication—which is occurring now but needs to be continually reinforced.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/26/2016
Time: 2:30 PM

Facilitator: Kathy Harris
CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
Joe Weigand	MDT-Biologist Missoula District	444-9205	joweigand@mt.gov

Agenda Topics

A meeting was held on August 26, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. WFF
 - b. Exclusionary fencing & jump outs
 - c. Crossings and/or jump outs
 - d. Efforts to reduce collisions and/or efforts to benefit wildlife
2. Decision for WA:
 - a. Needs to occur when projected is nominated & budget set-or, in MDT's process, then the WA set up a scope-creep and cost-driven clash.
 - i. Current WA justification is the document to define need and justification. This occurs later than BRR. Note-the BRR's purpose is not to document WA, but rather the biological conditions.
 1. Should justification be a stand-alone Activity?
 2. Stand-alone activity will help with consistency, possibly predictability.
 - ii. Recognize the project nomination is a snapshot of time.
 - iii. Need a tool to prompt communication at nomination time.
 - b. Consider red/yellow/green status to indicate potential/risk for WA that may affect budget.
 - c. For PFR efforts, this is a good time for discussion between functional areas.
 - d. Decision Document.

- i. PFR/SOW Report needs a stand-alone section on WAP to document decisions (for inclusion or exclusion).
- ii. Include future land use potential in MDT decision for WA (for development or scale of landscape). If known development potential is high, MDT may not want to invest money. This is judgement call which should/may influence decision. May need an MDT tool for this element.
- e. Design Efforts: need well before AGR.
 - i. Analysis (Traffic Safety). Typically, project uses vehicle-wildlife crash data which document human safety but does not represent wildlife safety or connectivity. Can use carcass data for some wildlife issues.
 - ii. Need awareness of WA across the functional areas.
- f. Other key factors include public involvement. This effort varies across Districts; Can gain support and advocacy but can also require additional effort.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 8/31/2016

Time: 7:30 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	406-441-5784	kathy.harris@kljeng.com
Paul Sturm	MDT - Biologist	406-444-9438	psturm@mt.gov

Agenda Topics

A meeting was held on August 31, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Past WA Experiences:

- a. Havre bridge replacement. Replaced old wooden bridge, not with culvert, but with bridge with oversized opening and wing fencing. Supported due to crash history and biologic needs. FWP desired permeable road (not exclusionary fencing along length) but also supported some WA; which was justification for crossing. (to MDT Design Team).
- b. US 89 near Bynum. Older, corridor EIS identified T&E species (grizzly) and consideration for future crossings (when projects are developed). Multiple projects have resulted. FWP supported need for crossings but did not have pre- or post-data (for crossings or movement). Bridge replaced existing culvert and included accommodation for wildlife.
- c. Hwy 200 east of Lincoln.
 - i. Multiple RA agency support for WA (USFS, USFWS, FWP, maybe DNRC) over 7-mile length. Recognized not entire length but focused on finding preferred locations.
 - ii. Late addition of bridge crossing due to specific elk kill (4 elk killed). Affected design but was included by DA.
 - iii. Design team realized limited grade changes due to intersecting highway so bridge opening sizes were a compromise to get as large as opening with minimal grade changes.

- iv. At Alice Creek, old timber bridge was replaced with large opening. Girder depth was reduced, additional spans added as part of iterative design to maximize the opening. Key was to confirm the minimal opening size needed (for grizzly) then work the bridge design back to fit. Good iterative design team efforts.
 - v. Biologist requested flashing warning signs at exclusionary fence endings. Warning signs are now being added but not flashing. Local users are aware but signs may warn unfamiliar drivers.
 - vi. Unique efforts to meet with local citizens to help locate crossings. Sought public input but, in large part, due to local citizen efforts/knowledge.
- d. No WA but on Blackfeet reservation; MDT is now fencing R/W due to open range concerns. (owned & maintained by MDT).
2. WA Justification.
- a. Paul has prepared a number of memos. Included cost impacts in memo. Worked with bridge on the comparative costs and increased construction costs. Timing of the memo was about AGR (need adequate engineering data to establish costs). Costs were construction but could also reflect safety savings and/or wildlife loss cost. Noted that wildlife costs could be represented by the FWP price per animal but this does not represent revenue generation from wildlife.
 - b. Justification can be based upon less data, but then gets scrutiny from design team.
 - c. Timing of this memo:
 - i. AGR can be fluid, with grade & alignment changes occurring after that. If so-justification memo & costs would be different. Need iterative design effort.
 - ii. Consider two-level justification so that 1st level identifies need, location, size, and type of animal, then 2nd level might occur after AGR-to justify and include costs.
3. Timing for WA:
- a. BRR is too early for project details. BRR does instigate RA discussions.
 - b. Need WA acknowledgment at Project Nomination stage to address budget impacts, which seem to drive many of the end decisions to include/exclude. Is there a potential to include risk for hot spot WA? MDT Culture does not recognize need for WA. Discussed that Caltrans had more extensive scoping process for projects which incorporate all enviro concerns at earliest stage.
4. In your position at MDT, Wildlife Accommodations development includes:
- a. Analysis (Traffic Safety): Provide the carcass & crash data/reports. No known safety projects nominated for wildlife reasons.
 - b. Design: need iterative team. Design efforts should involve biologist through all stages to bid.

- c. Construction/Installation: Get involved in permitting and construction of some plans specifics which can improve relationship with permitting agency, especially if construction modification occurs. Further education of Construction staff on need for WA is needed.
 - d. Maintenance: Get involved in permitting (for maintenance activities, e.g. stream work) and beneficial for construction interaction which can improve relationship with permitting agency, especially if construction modification occurs. Further education of Maintenance staff on need for WA is needed.
- 5. Other process needs
 - a. Predictability/Consistency across Districts. Need to encourage consistent involvement/respect for wildlife science. Recognize that District wildlife impacts vary due to different traffic demands (e.g. night travel is very low in this District so highway needs may be different than district with more night-time traffic).
 - b. Recognize that any WA process should not limit flexibility of application. All projects are unique. But need to move forward (avoid past history as the only way to do something).
- 6. Other: Consider funding sources for tweaking WA after they have been built and in use. Consider program similar to the statewide reclamation seeding budget or separate statewide fund for WA adjustments.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 9/2/2016

Time: 11:00 AM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
RJ Snyder	MDT -Road Design - GTF	406-444-6229	rosnyder@mt.gov

Agenda Topics

A meeting was held on September 2, 2016 at MDT Offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Crossings
 - b. Fencing
2. MDT projects that typically include WA include:
 - a. Reconstruction where hydraulics, bridge, Geotech are already engaged. This works to get early communication started.
3. Past experience w/ WA:
 - a. Lincoln East.
 - i. 2nd crossing added @ PIH where Maintenance staff identified 4 elk killed. Crash data supported this was wildlife area. 2nd crossing added by DA and design was re-worked.
 - ii. Noted that crash data (at that time) was not GPS but supported general condition. Not specific location.
 - iii. Encountered groundwater in Construction. Area has changing conditions but no groundwater had been identified at crossing location. Groundwater was dealt with by Construction crew. Unclear if this could have been identified in design process (very dynamic groundwater conditions).
 - b. E of Kiowa E
 - i. Due to beaver presence in corridor, culverts were upsized (to 48" +) to remove potential for running water (which may attract beaver dam locations based upon

- one single study). Maintenance concurred that they spend a lot of time removing beaver dams in the corridor culverts.
- c. N of Great Falls-corridor widening. Initial conversation with Biologist indicated low need (for WA) so will not be carried forward.
4. WA Decisions:
- a. Decision desirably at AGR.
 - b. Definitely before R/W limits are sets (before R/W acquisition begins).
 - c. Strongly suggest a pre-AGR (or Design Concept Review) to present a preliminary grade so that functional areas and WA can then be considered based on likely grade/alignment. Also, identify wildlife hot-spot issues. Presenting pre-AGR road design allows productive input from key stakeholders (functional designers) to integrate disciplines/functional areas. Allows for collaborative input prior to AGR and then allows AGR to be decision milestone.
 - d. Possibly at 950 Activity (see # immediately below)
5. WA Input: should be provided/sought out at Project Nomination. ESS should check with biologists at nomination stage. This allows nomination to include and 950 Activity to document key decisions for wildlife. Encourage regular communication between ESS and PM.
6. Wildlife awareness is strong due to general background of staff at MDT and due to Montana environs.
7. At MDT, functional involvement with Wildlife Accommodations development:
- a. Nomination: ESS should contact Biologist and then include in 950 Activity
 - b. Funding allocations-Needed at Project Nomination but be flexible as this can adjust throughout project.
 - c. Safety: get invited to PFR but are more focused on using safety data to nominate HSIP program. Not typically much involvement in design of other projects.
 - d. Design
 - i. PM should know to contact biologist to ferret out any issues very early in design. PM should know (but may need to be included into activity for consistency). PM is responsible for interactive and iterative design process.
 - ii. PM and engineers and enviro staff need to be flexible. Engineering flexibly can benefit from the EPM seeking out this interaction early and listening and then leading functional units.
 - iii. Incorporate Biologist and Environmental Services staff into project design team.
 - e. Construction. No comments.
 - f. Maintenance. Past experience shows valuable input onto crash/carcass locations. Good (vital) to have involved at PFR level.
8. Criteria/factors for needs/justification:
- a. Wildlife needs to be established by the biologist. Design team should trust the source and use the professional recommendation.

- ↳
 - b. Feasibility or justification. Has been included in initial (WA) recommendations report.
 - i. Process may benefit from requirement that WA has been considered, perhaps a check list (similar to WZSM where a TMP is required if a detour is planned. WZSM process is now defined step in project design).
 - c. Iterative design can be increased by a PM that confirms (WA) is a project issue that requires/leads designers to address. Can require meeting with stakeholders to come to consensus for final design treatment.
 - i. Lack of Wildlife design standards is not issue for RJ who felt comfortable with providing flexibility/adaptability and he uses a process to pull functional areas together for resulting consensus.
 - d. Discussed design exception report and needs.
- 9. Other-communication and flexibility are key to successful project.

File: 4215002, Meetings

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 9/9/2016
Time: 10:00 AM

Facilitator: Kathy Harris
CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Bill Squires	MDT Road Design	444-6228	bsquires@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A meeting was held on September 9, 2016 at MDT offices to discuss Wildlife Accommodations (WA). *Action items are shown in italics.*

1. Wildlife Accommodations include:
 - a. Passage or (typically) Crossings
 - b. Tree Clearing or R/W treatment. Such as North of Seeley Lake to limit disturbance to grizzly/lynx. Allowed trees within the clear zone in select/spot areas.
 - c. Reduce clear zone to 50 mph (for project with overall higher design speed). For Condon project in the 90's to improve grizzly passage.
2. Past WA experiences:
 - a. Increase bridge opening for wildlife crossings. Based on iterative input from Biologist and Engineering to develop a compromise design.
 - b. Thompson Falls where signage was added to a rockfall project.
 - c. MT 200 corridor when Pat Basting suggested crossings around Thompson Falls. Safety data showed crashes (on map) and maintenance provided carcass input and Pat (biologist) led process to coordinate design features. This timing met AGR schedule and influenced multiple, separate construction projects within the corridor.
 - i. East of Thompson River East had a good bridge location where an existing culvert in deep fill was replaced with precast, simple bridge to allow wildlife crossings. Cameras were used to show the wildlife usage (when time allows-this is very helpful).

- d. MT 206 when a landowner requested a stock pass which led to slope flattening. Wildlife usage is thought to occur so shared stock/wildlife usage is provided for.
3. Timing:
- a. Sometimes at PFR, if the biologist raises issue to be evaluated.
 - b. Can also occur during Biologist Assessment (BA).
 - c. Occasionally in the design stages. The District or Project Manager may be influential.
 - d. Frequently occurs during the AGR phase, with need identified by biologists. Can be multiple functional areas leading to iterative design effort.
 - e. Resource Agency: Note on Stevensville, the FWP has long involvement. RA asked for WFF (near Metcalfe Wildlife Area).
 - f. Public Involvement driven. Occasionally, design team has received comments on projects where public is asking for WA. Should public input be asked, specifically for WA?
4. Documentation Needs:
- a. Some of Bill's projects have used a memo from Environmental to identify the need and to justify WA. Noted that timing could be later than AGR. Need to watch timing.
 - b. SOW. This can document the need and the location for WA and can allow design features (such as final size) to be deferred to later.
 - c. Design Exceptions: Safety justification can be very strong.
5. Other:
- a. Consider additive bid items. This could help determine actual costs for WA and may allow project with limited budget to possibly consider WA.
 - b. Alternative bids could also be used, but may not be as informative.
 - c. Recognizing that crash data is under-reported, should we address/acknowledge crashes that result from avoiding animals (e.g.-record does not reflect first cause was avoiding animal that may lead to run-off-road or overturn, etc. and must be inferred from report)?
 - d. Funding is an issue-are there private or agency funds that could be used?

File: 4215002, Meeting

Meeting Minutes - Wildlife Accommodations Process

Development

Date: 9/21/2016
Time: 9:00 AM

Facilitator: Kathy Harris
CC Minutes: K. Christensen, MDT

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com
Vanna Boccadori	FWP - Butte Biologist	406-494-2082	VBoccadori@mt.gov

Agenda Topics

A phone call was held on September 21, 2016 to discuss Wildlife Accommodations (WA).
Action items are shown in italics.

1. Wildlife Accommodations include:
 - a. Fencing
 - b. Crossings (or allowance for passage)
 - c. Signage, both warning of wildlife crossing and more speed limit signs
 - d. Vegetation on roadside. Emphasized that (MDT) should use native seeding mix and avoid introducing non-native specific in disturbed areas. Noted this may require more than a single application.
 - e. Weed treatment. Especially in areas disturbed by construction. Noted this may require more than a single application.
 - f. Accessibility: Provided parking pull-outs and scenic pull-outs (on Mill Creek Road) for better accessibility to wildlife viewing and/or fishing, which help FWP complete their mission.
2. MDT/WA interaction:
 - a. Vanna manages the Mt Haggin WMA. Long history with MDT road process.
 - b. Boulder South-South. FWP conservation easement was shared early on. Early discussion with MDT biologists were good and brought data into discussion early. FWP preferred no road improvements (higher speeds, etc.) but felt listened to for wildlife mitigation discussions.
3. Concerns:

- a. MDT projects that reduce curves result in higher travel speeds and/or increased traffic volumes. Poor for wildlife.
 - b. MDT widening projects increase barrier for wildlife, create more (potential for) conflict and can have indirect effects.
 - c. MDT Biologist should make the inquiry (from FWP) early and then FWP needs to respond in timely manner.
- ◇
- d. Land Ownership at Wildlife Undercrossing. Some private owners do not want wildlife channeled toward their lands. FWP does not have a mechanism for assisting MDT with preserving land (uses) at ends of undercrossings. Note that conservation easements include a mechanism to assure that the owner does not have "an undue burden of use" due to the easement (e.g., allow for a special hunting period if the easement area has increase in ungulates). Rick Northrup, Habitat Bureau Chief at FWP is better contact for landowner issues.
4. WA experience:
 - a. Good: Working with Forest Service on road in Big Hole. Early meetings in field with both designers (engineers) and biologists. Early communication, compromise.
 - b. Good: Moose Creek Road (or Mill Creek Highway).
 - c. Bad: Wise River or Highway 43. FWP did not get involved early enough. Project installed wildlife exclusionary fencing on curve with crash history (description indicated no other crossing accommodations were included with exclusionary fencing).
 5. Data:
 - a. FWP can provide population data. Some info is available on public website but more detailed data can be provided for specific projects, from the FWP Biologist.
 - b. Discuss B/c ratios and lack of "hard" costs for wildlife.
 - i. Direct cost of animal death
 - ii. Indirect cost of displacement (cause by road widening/changes or by greater vehicles and greater conflict potential). No hard data is currently defined for the value of the wildlife. Studies to shot ha wildlife contribute to the state's economy-should this be considered?
 6. Summary:
 - a. MDT & FWP Biologists involved early in project. FWP staff needs to be responsive to data requests.
 - b. Design should be iterative and educate both engineers (for wildlife needs) and biologists (for road design limitations).
 - c. Compromise may be necessary.

File: 4215002, Meeting

Meeting Minutes - Wildlife Accommodations Process

Development

Date: Date

Time: Time AM/PM

Facilitator: Kathy Harris

CC Minutes: K. Christensen, MDT; Others?

Attending:

Name	Company/ Organization	Phone Number	E-Mail
Bill Semmens	MDT	444-7227	bsemmens@mt.gov
Kathy Harris	KLJ	441-5784	kathy.harris@kljeng.com

Agenda Topics

A [meeting/conference call/etc.], was held on [date] at [time] at [location] to discuss [purpose]. *Action items are shown in italics.*

1. How would you define Wildlife Accommodations/Mitigation/Strategy (term will likely flex between various interviews)?
2. Have you had wildlife encounter while driving on public roads?
3. Do you enjoy wildlife in your personal life? In what ways?
4. In your position at MDT, what is your professional role with Wildlife Accommodations development (strive to determine difference from evaluating feasibility and recommendation of features):
 - a. Analysis (Traffic Safety)
 - b. Planning
 - c. Design
 - d. Construction/Installation
 - e. Maintenance (carcass/collisions)
 - f. Funding allocations
 - g. Enforcement
 - h. Other?
5. In your position at MDT, have your past experiences with wildlife accommodations been?
 - a. Good/beneficial
 - i. Why and how to expand beneficial - what worked - and why
 1. Funding
 2. Timing (within MDT Process)
 3. Determination/Analysis Criteria

4. Need and/or Feasibility
 5. Other?
- b. Bad/detrimental - what didn't work - and why
 - i. Why and how to expand detrimental - what didn't work - and how to improve
 1. Funding
 2. Timing (within MDT Process)
 3. Determination/Analysis Criteria
 4. Need and/or Feasibility
 5. Other?
 - c. None (no experience)
6. From your professional perspective and knowledge base, what criteria/factors should be included for determining the:
 - a. need
 - b. feasibility
- of Wildlife Accommodations?
7. In your role at MDT, what are critical process needs (for Wildlife Accommodations) and their priority/ranking? Sample may include:
 - a. Timing of critical decision points (activity or flowchart)
 - b. Criteria to include/not include wildlife accommodations
 - c. Predictability/Consistency
 - d. Documentation needs/requirements
 - e. Other key factors? (agency involvement, public, other)
 - f. How to document decision
 - g. Other?
 8. Other?

Other Notes or Information

File: 4215002, Meetings

Next Meeting Information

Date: Date

Time: Time

Facilitator: Name

Minutes: Name



Appendix B

BRR / PBA Table of Contents



**TABLE OF CONTENTS for CONSULTANT
BIOLOGICAL RESOURCE REPORT/PRELIMINARY BIOLOGICAL ASSESSMENT
Revised January 2018**

This outline should be used in formatting a Biological Resources Report/Preliminary Biological Assessment (BRR/PBA) for MDT projects. Section 1.0 provides a discussion of the general project area. Beginning with Section 2.0, all analysis and discussion should focus on the project specific study area.

Refer to Activity 182 Biological Resource Report/Preliminary Biological Assessment for specific instruction and tasks required to complete the BRR/PBA.

Some sections may not apply based on project location, absence of specific resources, and/or scope of work. In such cases, include the section heading and a brief explanation why the section is not relevant to the project. If a section is not relevant, do not include related subsections in the document.

EXECUTIVE SUMMARY

1.0 INTRODUCTION

- Detailed Project Description and Location
- Ecological Setting and General Area Description
 - Land cover
 - Ecoregion (Woods, Payne, Nesser, et al.)

2.0 TERRESTRIAL RESOURCES

2.1 GENERAL HABITAT/VEGETATION COMMUNITIES

- Methods
 - Agency Coordination/Consultation
 - Literature/Database Searches
 - Field Survey Protocol
- Land use/land ownership
- Species present, general abundance, distribution, indicator status
- Potential Impacts
- Avoidance and Minimization Recommendations

2.2 NOXIOUS WEEDS/REGULATED PLANTS

- Methods
 - Agency Coordination/Consultation
 - Literature/Database Searches
 - Field Survey Protocol
- Species present, distribution, degree of infestation, status
- Avoidance and Minimization Recommendations

2.3 GENERAL WILDLIFE SPECIES

- Methods
 - Agency Coordination/Consultation
 - Literature/Database Searches

- Field Survey Protocol
- 2.3.1 **MAMMALS**
Species observed/document, general abundance, distribution,
and habitat requirements
Potential Impacts
Avoidance and Minimization Recommendations
- 2.3.2 **BIRDS**
Species observed/document, general abundance, distribution,
and habitat requirements
Potential Impacts
Avoidance and Minimization Recommendations
Include requirements under the Migratory Bird Treaty Act and
the Bald and Golden Eagle Protection Act
- 2.3.3 **REPTILES and AMPHIBIANS**
Species observed/document, general abundance, distribution,
and habitat requirements
Potential Impacts Avoidance and Minimization Recommendations

2.4 WILDLIFE ACCOMMODATION NEEDS AND OPPORTUNITIES

A wildlife accommodation is defined as “a feature or strategy designed and implemented into a transportation facility to moderate the effects of the infrastructure on wildlife and their habitat. The objective is to minimize or eliminate barriers to wildlife movement, protect important habitat components within the landscape, and reduce or eliminate the potential for wildlife-vehicle conflicts”.

Methods

- Agency Coordination/Consultation
- Literature/Database Searches
- Animal carcass/crash analysis
- Field Survey Protocol

Needs Analysis

Discuss the species present in the project area, movement patterns including trails, sign, observed live animals and/or carcasses, collision and carcass data, etc., barriers to wildlife movement, habitat suitability, current and any documented future adjacent land use, and any wildlife needs that may warrant accommodation with the project. Specifically mention if a wildlife accommodation is recommended as a conservation measure for a federally listed species under the Endangered Species Act or special status species under other federal, Tribal, or state requirements.

General Recommendations

Make general conceptual recommendations to address these needs for consideration during project development. Identify apparent potentially affected design elements for further feasibility analysis with the Design Team (grade, right-of-way, structure sizes, natural or cultural resources, geotechnical or hydraulic considerations, constructability, utilities, etc.) Specific and detailed recommendations will be made later in project development under Activity 707/109 Wildlife Accommodation Recommendation Memo (WARM).

3.0 AQUATIC RESOURCES

3.1 WATERWAYS (rivers/streams/drainages, irrigation facilities)

Methods

- Agency Coordination/Consultation
- Literature/Database Searches
- Field Survey Protocol

Site Description/Stream Morphology

Total Maximum Daily Load (TMDL) Listing 303(d)

Potential Impacts

Avoidance and Minimization Recommendations

Permitting Required

Stream Mitigation Requirements

Exemptions

Baseline Stream Factors

Stream Type

Stream Order (Strahler)

Stream Status

Existing Condition

Dominant Impact (Collective Impact)

Credit Factors (stream credit opportunities)

Riparian Enhancement

Stream Channel Restoration

4.1 GENERAL AQUATIC SPECIES

Methods

- Agency Coordination/Consultation
- Literature/Database Searches
- Field Survey Protocol

Species observed/documentated, general abundance, distribution, and habitat requirements

Potential Impacts

Avoidance and Minimization Recommendations

Include Resource Agency recommendations for instream timing restrictions

4.3 WETLANDS

Methods

- Agency Coordination/Consultation
- Literature/Database Searches
- Field Survey Protocol/Wetland Delineation Methods

Description of Delineated Wetlands

Potential Impacts

Avoidance and Minimization Recommendations

Required Permitting

Proposed Compensatory Wetland Mitigation Strategy

5.0 SPECIES OF CONCERN and SPECIAL STATUS SPECIES

Methods

- Agency Coordination/Consultation
- Literature/Database Searches
- Field Survey Protocol

5.1 PLANTS

Species observed/documenting, general abundance, distribution, and habitat requirements

Potential Impacts

Avoidance and Minimization Recommendations

5.2 TERRESTRIAL SPECIES

Species observed/documenting, general abundance, distribution, and habitat requirements

Potential Impacts

Avoidance and Minimization Recommendations

5.3 AQUATIC SPECIES

Species observed/documenting, general abundance, distribution, and habitat requirements

Potential Impacts

Avoidance and Minimization Recommendations

6.0 THREATENED AND ENDANGERED SPECIES

PRELIMINARY BIOLOGICAL ASSESSMENT

Methods

- Agency Coordination/Consultation
- Literature/Database Searches
- Field Survey Protocol

Species status, distribution, habitat requirements, reasons for decline

Environmental baseline/documenting or potential occurrence/behavior in the project area

Potential Impact Analysis

Preliminary Determination of Effect

Threatened or Endangered Species and designated critical habitat:

No Effect or May Affect

Make only a *No Effect* or a *May Affect* determination. If a *May Affect* determination is made, do not include *Likely* or *Not Likely to Adversely Affect*. State that: “A final Determination of Effect will be made at a later phase in project development in coordination/consultation with the USFWS.”

Proposed or Candidate Species:

Not Likely to Jeopardize the Continued Existence or

Likely to Jeopardize the Continued Existence

Potential Cumulative Effects Analysis

Recommended Conservation Measures

REFERENCES**LIST OF TABLES AND FIGURES****APPENDICES** Including but not limited to:

- Project location map
- Topographic/aerial maps
- Agency coordination letters and phone call logs
- Photographs of relevant sites
- Completed USACOE Wetland Delineation Forms
- Completed MDT MT Wetland Assessment Method Forms
- Wetland delineation maps (plan sheets/aerial photos)
- MTNHP Element Occurrence/Species of Concern Data report
- Species lists (common and scientific names)



Appendix C

Activity 707, 109 and WARM Template



ACTIVITY 707 Wildlife Accommodation Recommendation Memo (WARM)

(06/07/2018)

DEFINITION:

Detailed recommendations for wildlife accommodations based on the initial wildlife needs analysis and general recommendations for the project. Prepare a memo detailing project-specific wildlife accommodations for further feasibility analysis by the Design Team. The feasibility analysis is expected to be an iterative process taking place between distribution of the WARM and Prepare for Scope of Work activity. Alternate accommodations will be considered and recommended for further evaluation if any original recommendations put forth under this activity are deemed to be infeasible.

TASKS:

For in-house projects:

The MDT District Biologist performs the following tasks in preparation of the WARM:

1. Summarize the wildlife needs analysis and general recommendations initially put forth in the Biological Resources Report/Preliminary Biological Assessment (BRR/PBA) for the project. Mention if a recommended wildlife accommodation is intended to benefit a federally listed species under the Endangered Species Act or special status species under other federal, Tribal, or state requirements.
2. Provide a discussion of additional work that was done following the BRR/PBA to verify animal movements, carcass, collision, land-use, and other relevant data to ensure accuracy and applicability. Discuss coordination with Resource and/or Tribal Agency wildlife personnel as necessary. Document any changes from data or analysis previously reported in the BRR/PBA.
3. Enumerate wildlife accommodation recommendations by project location. Location can be identified by reference post range, station range, intersecting roadways, or geographic features, etc. Include a map and other attachments as appropriate.
 - 3.1 Discuss the accommodation type(s) and focal species. Include rationale for the location and type (safety and/or connectivity data, agency coordination, public input, literature review, environmental commitments, logistics, opportunity, etc.). Provide a discussion of the expected benefits of the wildlife accommodation to public safety and/or wildlife connectivity.
 - 3.2 Discuss current adjacent land use and any documented future land use changes (platted for subdivision, etc.). Document any previous landowner and/or land management agency coordination or if additional coordination is needed, existing or potential easements or protections, etc.
 - 3.3 Provide a cost estimate for the wildlife accommodation including capital investment, operation and maintenance. Coordination with the Design Team is encouraged at this stage to estimate wildlife accommodation costs. A range of costs may be appropriate if an accommodation can be constructed using different

materials or methods. Identify operation and maintenance needs and anticipated schedule for the accommodation.

3.4 Identify apparent potentially affected design elements for further feasibility analysis with the Design Team (grade, right-of-way, structure sizes, natural or cultural resources, geotechnical or hydraulic considerations, constructability, utilities, etc.).

3.5 Discuss the need for further coordination with Resource and/or Tribal agencies, or manufacturers/vendors of wildlife accommodation technology. Identify if additional research is needed prior to issuance of the Wildlife Accommodation Decision Report (WADR).

4. Prepare the Wildlife Accommodations Recommendations Memo and attachments for signature of the Environmental Bureau Chief and District Design Team distribution.

Start Dependencies:

ACT 706: Biological Resources Report (F/S)

Successors:

ACT 212: Preliminary Plan Preparation (F/F)

ACT 205: Prepare for Public Hearing (F/F)

For Consultant Design projects (Activity XXX Activity Title):

Consultant Project Biologist prepares Draft Wildlife Accommodations Recommendations Memo and submits electronic Word format document to MDT. The MDT District Biologist reviews and comments on Draft WARM.

Consultant Project Biologist incorporates comments and finalizes WARM. Consultant provides a PDF and Word electronic version of final document and attachments. The MDT District Biologist obtains signature of Environmental Bureau Chief, files and distributes final WARM as needed.

Start Dependencies:

ACT 100: Interactive Project Evaluation

ACT 182: Biological Resource Report/Preliminary Biological Assessment

Not Applicable for Transportation Alternative (TA) Projects

ACTIVITY 109 Wildlife Accommodation Recommendation Memo (WARM)

(08/16/18)

CORRESPONDING MDT REVIEW ACTIVITY:

707 Wildlife Accommodation Recommendation Memo (WARM)

DEFINITION:

Detailed recommendations for wildlife accommodations based on the initial wildlife needs analysis and general recommendations for the project. Prepare memo detailing project-specific wildlife accommodations for further feasibility analysis by the Design Team. The feasibility analysis is expected to be an iterative process taking place between distribution of the WARM and Prepare for Scope of Work activity. Alternate accommodations may be considered and recommended for further evaluation if any original recommendations put forth under this activity are deemed to be infeasible.

NOTES:

Receive MDT approval prior to making contact with any regulatory agencies, State, Federal, Tribal, and/or public entities. Submit the draft versions of all agency correspondence to MDT for review and approval.

Prepare the WARM according to the most recent MDT Wildlife Accommodation Recommendation Memo Template.

TASKS:

Draft WARM

1. Summarize the wildlife needs analysis and general recommendations initially put forth in the Biological Resources Report/Preliminary Biological Assessment (BRR/PBA) for the project. Mention if a recommended wildlife accommodation is intended to benefit a federally listed species under the Endangered Species Act or special status species under other federal, Tribal, or state requirements.
2. Provide a discussion of additional work that was done following the BRR/PBA to verify animal movements, carcass, collision, land-use, and other relevant data to ensure accuracy and applicability. Discuss coordination with Resource and/or Tribal Agency wildlife personnel as necessary. Document any changes from data or analysis previously reported in the BRR/PBA.
3. Coordinate with the MDT District Biologist regarding wildlife accommodations under consideration prior to inclusion as a project-specific recommendation in the draft WARM.
4. Enumerate wildlife accommodation recommendations by project location. Location can be identified by reference post range, station range, intersecting roadways, or geographic features, etc. Include a map and other attachments as appropriate.
 - 4.1 Discuss the accommodation type(s) and focal species. Include rationale for the location and type (safety and/or connectivity data, agency coordination, public input, literature review, environmental commitments, logistics, opportunity, etc.). Provide a discussion of

the expected benefits of the wildlife accommodation to public safety and/or wildlife connectivity.

4.2 Discuss current adjacent land use and any documented future land use changes (platted for subdivision, etc.). Document any previous landowner and/or land management agency coordination or if additional coordination is needed, existing or potential easements or protections, etc.

4.3 Provide a cost estimate for the wildlife accommodation including capital investment, operation and maintenance. Coordination with the Design Team is encouraged at this stage to estimate wildlife accommodation costs. A range of costs may be appropriate if an accommodation can be constructed using different materials or methods. Identify operation and maintenance needs and anticipated schedule for the accommodation.

4.4 Identify apparent potentially affected design elements for further feasibility analysis with the Design Team (grade, right-of-way, structure sizes, natural or cultural resources, geotechnical or hydraulic considerations, constructability, utilities, etc.).

4.5 Discuss the need for further coordination with Resource and/or Tribal agencies, or manufacturers/vendors of wildlife accommodation technology. Identify if additional research is needed prior to issuance of the Wildlife Accommodation Decision Report (WADR).

5. Prepare and include all attachments.

Final WARM

1. Incorporate comments received and prepare the Final WARM.

Note: All memos submitted under this activity require the signature of the document's author(s).

START DEPENDENCIES:

Completion of Activity 182

DELIVERABLES:

1. Draft Wildlife Accommodations Recommendations Memo (WARM) (electronic Word format).
2. Final Wildlife Accommodations Recommendations Memo (WARM) (electronic Word and PDF format).



Montana Department of Transportation

PO Box 201001
Helena, MT 59620-1001

Memorandum

To: Distribution

From: Tom Martin, P.E.
Environmental Services Bureau Chief

Date: Date Submitted to Engineer.

Subject: [ProjectNumber] MDT Wildlife Accommodation Recommendation Memo (WARM)
[Project Name]
UPN [UPN]
Work Type Work Type

This memo reflects the project-specific wildlife accommodations that are being recommended by Environmental Services for further consideration by the Design Team. During preparation of the Biological Resources Report/ Preliminary Biological Assessment (BRR/PBA) for this project, an initial wildlife needs analysis identified various wildlife needs and presented general recommendations for consideration.

Proposed Scope of Work

[Provide a brief description of the proposed scope of work from the most recent approved milestone document.]

Project Location and Limits

[Provide a description of the project location from the most recent approved milestone document.]

Wildlife Needs Analysis Summary

[Summarize the wildlife needs analysis and general recommendations initially put forth in the BRR/PBA for the project BRR/PBA. Mention if a recommended wildlife accommodation is intended to benefit a federally listed species under the Endangered Species Act or special status species under other federal, Tribal, or state requirements.]

Wildlife Needs Verification and Supporting Documentation

[Provide a discussion of additional work that was done following the BRR/PBA to verify animal movements, carcass, collision, land-use, and other relevant data to ensure accuracy and applicability. Discuss coordination with Resource and/or Tribal Agency wildlife personnel as necessary. Document any changes from data or analysis previously reported in the BRR/PBA.]

Wildlife Accommodation Recommendations

[Enumerate wildlife accommodation recommendations by project location. Location can be identified by reference post range, station range, intersecting roadways, or geographic features, etc. Include a map and other attachments as appropriate.]

1. Discuss the accommodation type(s) and focal species. Include rationale for the location and type (safety and/or connectivity data, agency coordination, public input, literature review, environmental commitments, logistics, opportunity, etc.). Discuss expected benefits of the wildlife accommodation to public safety and/or wildlife connectivity.

2. Discuss current adjacent land use and any documented future land use changes (platted for subdivision, etc.). Document any previous landowner and/or land management agency coordination or if additional coordination is needed, existing or potential easements or protections, etc.
3. Provide a cost estimate for the wildlife accommodation including capital investment, operation and maintenance. Coordination with the Design Team is encouraged at this stage to estimate wildlife accommodation costs. A range of costs may be appropriate if an accommodation can be constructed using different materials or methods. Identify operation and maintenance needs and anticipated schedule for the accommodation.
4. Identify apparent potentially affected design elements for further feasibility analysis with the Design Team (grade, right-of-way, structure sizes, natural or cultural resources, geotechnical or hydraulic considerations, constructability, utilities, etc.).
5. Discuss the need for further coordination with Resource and/or Tribal agencies, or manufacturers/vendors of wildlife accommodation technology. Identify if additional research is needed prior to issuance of the Wildlife Accommodation Decision Report (WADR).

Copies:

[Click to choose a date.](#)

Distribution (without attachments):

Distribution (electronic only)

cc:

Choose a District.



Appendix D

WADR Template



Montana Department of Transportation

PO Box 201001
Helena, MT 59620-1001

Memorandum

To: Name
Title

From: NameName..
[Appropriate] Bureau Chief

Date: Date Submitted to Engineer.

Subject: [ProjectNumber] MDT Wildlife Accommodation Decision Report
[Project Name]
UPN [UPN]
Work Type Work Type

This memo documents decisions and justification to Accept, Modify, or Reject recommendations made in the Wildlife Accommodations Recommendation Memo (WARM) for the subject project, dated [Click to choose a date](#). Recommendations Accepted or Modified will be advanced to the project design phase. The following individuals were involved in evaluation(s) of the WARM recommendations:

Staff Name	Title
------------	-------

WARM Recommendations: [Provide a brief summary of each of the recommendations identified in the WARM. For multiple recommendations, include the description, response, and justification for each recommendation prior to documenting the next.]

- 1. Recommendation #1 – Name.** Insert a brief summary of the recommendation (type and location) including the purpose and need of the recommended accommodation. Mention if a recommended wildlife accommodation is intended to benefit a federally listed species under the Endangered Species Act or special status species under other federal, Tribal, or state requirements.

[Select one of the following responses for each of the recommendations identified in the WARM. Provide ample justification to document the decision].

Accepted. [Provide concise direction to the project team for including the wildlife accommodation into the project design. Clarify what functional areas need to provide future input (geotechnical, road design, right-of-way, hydraulics, district, maintenance, etc.).]

Example: Accepted. Design a bridge meeting the recommended dimensions at Station XXX+XX Design exclusionary wildlife fencing (8-foot) to the recommended limits. Include four jump-outs within the exclusionary fence at locations to be determined. Include electro-mats at the fence ends in coordination with the vendor. The crossing and associated features need to be discussed in detail with the adjacent landowner to identify and address their concerns.

Accepted Modified. [Modified Accommodations meet the intent and scope of the original recommendation but alter the design to achieve feasible inclusion in the project. Provide a summary of why the original recommendation was deemed infeasible as proposed and subsequently modified. Provide a clear description of the proposed modification(s). Provide concise direction to the design team for including the modified wildlife accommodation into the project design. Clarify what functional areas need to provide future input (geotechnical, road design, right-of-way, hydraulics, district, maintenance, etc.).]

Example. Accepted Modified. A bridge was recommended at Station XXX+XX. A bridge at this location was deemed infeasible for several reasons. Geotechnical subsurface investigation has determined that there are weak subsurface soils present that would require an excessively deep foundation to support a bridge. Additionally, the project is in a seismically active area requiring special design considerations for a bridge. Lastly, due to the proximity of irrigation facilities and cultivated land, an off-set temporary detour is not desirable. There are no feasible alternate detour routes and closing the roadway is not an option due to the traffic volumes. The Design Team has agreed that a 12'h x 20'w box culvert is feasible at this location and would provide the necessary opening for wildlife movements. A box culvert can be built under phased construction, which will allow traffic to be maintained on the existing roadway. Guardrail should be considered to keep the culvert length as short as possible.

Design a 12'h x 20'w box culvert and include exclusionary wildlife fencing (8-foot) to the recommended limits. Include four jump-outs within the exclusionary fence at locations to be determined. Include electro-mats at the fence ends in coordination with the vendor. These crossing and associated features need to be discussed in detail with the adjacent landowner to ensure their concerns are appropriately addressed.

Rejected. [Provide a summary of why the original recommendation was deemed infeasible. Provide clear justification and rationale for not incorporating this wildlife accommodation into the project.]

Example: Rejected. The recommendation for an underpass at Station XXX+XX has been deemed infeasible for several reasons and will not be advanced to the design phase. An underpass appropriately sized for wildlife crossing would require a significant grade raise at this location. A grade raise would result in impacts to adjacent irrigation facilities and an historic building. A grade raise would also be problematic due to the proximity of several private approaches and would negatively affect sight distance due to the existing vertical curve and the county road intersection just north of this location. Additionally, high ground water elevations are documented in this area which may cause constructability issues and result in seasonal flooding of the proposed structure. Alternate sites in proximity to the recommended location are not feasible for similar reasons.

Accepted Alternate Accommodations. [Alternate Accommodations are wildlife accommodations that were not originally included in the WARM. They do not meet the intent or scope of the original recommendations in the WARM but were determined by the Design Team to be feasible wildlife accommodation options for inclusion in the project. Provide concise direction to the Design Team for including the alternate wildlife accommodation(s) into the project development process. Clarify what functional areas need to provide future input (geotechnical, road design, right-of-way, hydraulics, district, maintenance, etc.).]

Alternate Accommodation #1: Wildlife friendly fence

Example. Although the wildlife crossing structure recommended in the WARM has been rejected for the reasons stated above, wildlife friendly fencing is proposed to be negotiated with the adjacent landowner(s) to provide improved permeability for wildlife movements in this area.

Alternate Accommodation #2: Static wildlife signage with seasonal activation

Example. “Wildlife Crossing – Next 2 Miles” signage will be installed at Station XXX+XX and Station XXX+XX to address public concerns for elk movements that came to light after the WARM was completed. A flashing beacon or LED border attached to the signs will be activated seasonally from October 1st to April 30th. Further coordination with Maintenance regarding the seasonal activation of the beacons is required.

[Identify any anticipated effects to the project schedule and document if wildlife accommodation decisions introduce potential risk into the project delivery.]

If you have any questions or need additional information, please contact [MDT Project Design Manager or Consultant Project Manager] at [telephone number, email].

Copies:

[Click to choose a date..](#)

Distribution (without attachments):

Distribution (electronic only)

cc:

Choose a District.



Appendix E

MDT Wildlife Accommodations Process Desk Guide



VISION ZERO
zero deaths · zero serious injuries
MONTANA DEPARTMENT
OF TRANSPORTATION

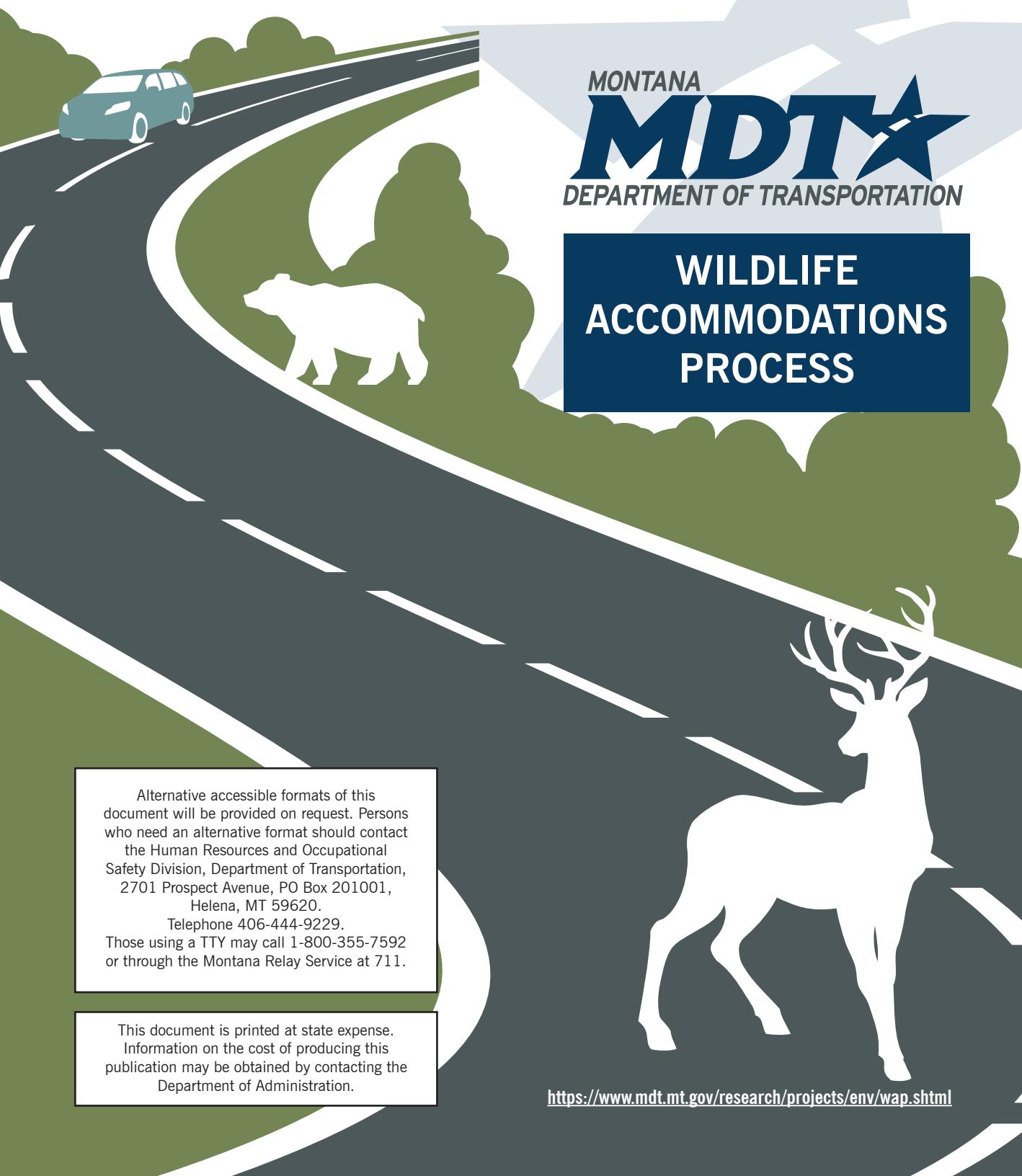
Who is Involved in the Wildlife Accommodations Process (WAP)?

The wildlife accommodations process is intended to bring all functional areas within MDT together during project development to assess the need and feasibility of wildlife accommodations. Input from the Design Team is critical to the process:

- District
- Planning
- Preconstruction
- Construction
- Maintenance

Please contact the Environmental Services Bureau Chief in Helena for questions about the WAP.

MDT's Mission: Serve the public by providing a transportation system and service that emphasize quality, safety, cost effectiveness, economic vitality & sensitivity to the environment.



MONTANA
MDT★
DEPARTMENT OF TRANSPORTATION

WILDLIFE ACCOMMODATIONS PROCESS

Alternative accessible formats of this document will be provided on request. Persons who need an alternative format should contact the Human Resources and Occupational Safety Division, Department of Transportation, 2701 Prospect Avenue, PO Box 201001, Helena, MT 59620. Telephone 406-444-9229.

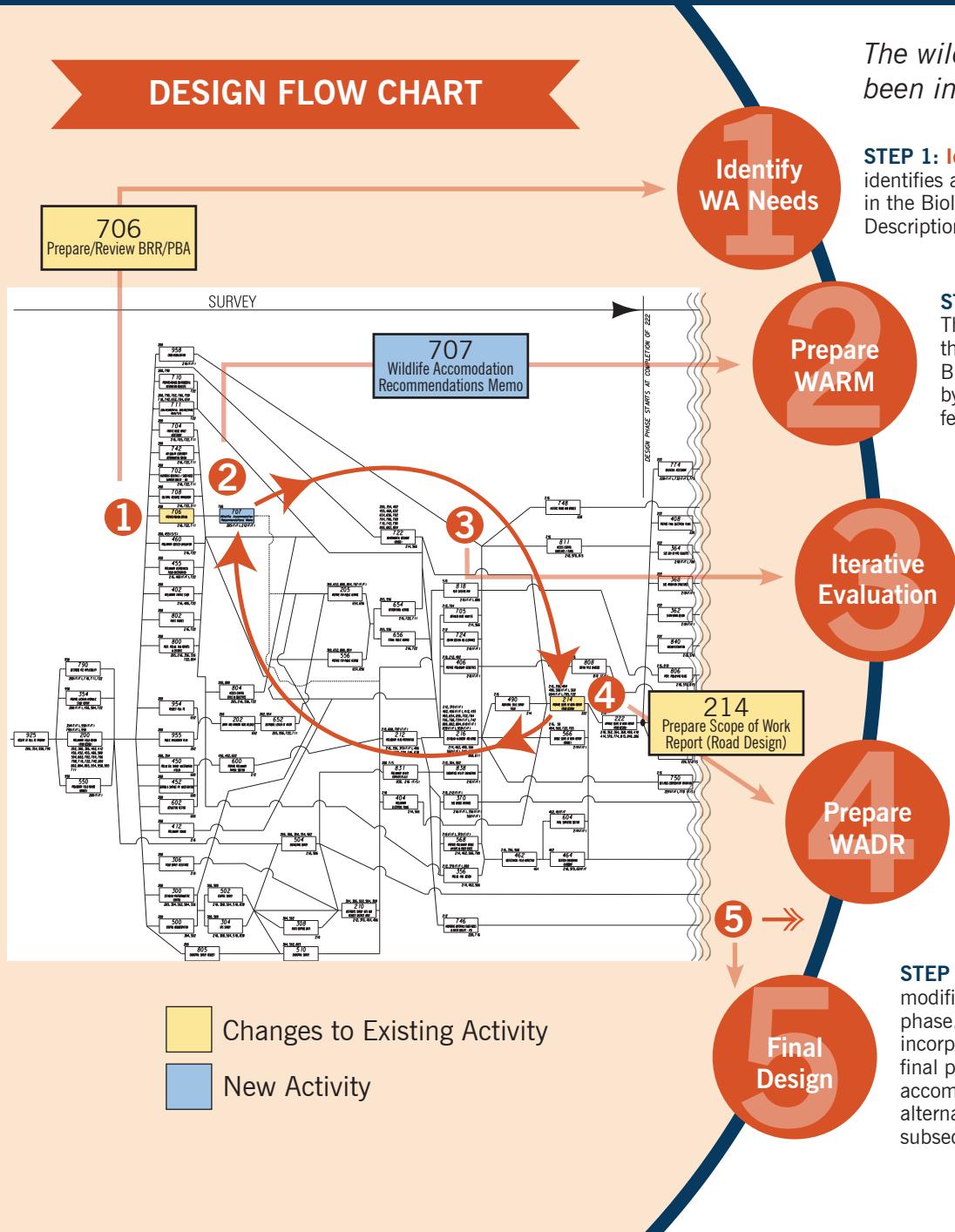
Those using a TTY may call 1-800-355-7592 or through the Montana Relay Service at 711.

This document is printed at state expense. Information on the cost of producing this publication may be obtained by contacting the Department of Administration.

<https://www.mdt.mt.gov/research/projects/env/wap.shtml>

Wildlife Accommodations are features designed and implemented into a transportation facility to moderate the effects of the infrastructure on wildlife and their habitat. The objective of these features is to minimize or eliminate barriers to wildlife movement, protect important habitat components within the landscape, and reduce or eliminate the potential for wildlife-vehicle collisions.

DESIGN FLOW CHART



The wildlife accommodations process is a series of steps that have been integrated into MDT's existing project development process:

STEP 1: Identify wildlife needs. Following the Preliminary Field Review, the District Biologist identifies and presents wildlife needs and general wildlife accommodation recommendations in the Biological Resources Report/Preliminary Biological Assessment (BRR/PBA) (See Activity Descriptions for Activity 706/182).

STEP 2: Prepare Wildlife Accommodation Recommendations Memo (WARM). The District Biologist presents detailed recommendations for wildlife accommodations in the WARM, based on the wildlife needs analysis and general recommendations from the BRR/PBA. (See Activity Descriptions for new Activity 707/109). The WARM is signed by MDT Environmental Services Bureau Chief and distributed to the Design Team for feasibility analysis during the iterative design process preceding Scope of Work.

STEP 3: Iterative evaluation process. The Design Team works closely, cooperatively, and iteratively to further evaluate the wildlife accommodation recommendations between the WARM distribution and the Wildlife Accommodation Decision Report (WADR). The feasibility of the WARM recommendations is explored through iterative evaluation. Recommendations are accepted, modified, or rejected for further development based on this evaluation. Alternate recommendations, not previously included in the WARM, may emerge during the iterative evaluation. The Design Team's findings are documented in the WADR.

STEP 4: Prepare Wildlife Accommodations Decision Report (WADR). The Project Design Manager prepares a decision memo (WADR) under the Prepare Scope of Work Report activity documenting the Design Team's decisions resulting from the iterative design process in Step 3. The WADR documents wildlife accommodations that will advance to final design, those that will not advance, and full justification as to why each accommodation was accepted, modified, rejected, or proposed as an alternate by the Design Team. The WADR is signed by the appropriate Bureau Chief for the project. The results of the WADR should be summarized in the Environmental Considerations section of the Scope of Work Report.

STEP 5: Design phase. Following approval of the Scope of Work Report, the accepted, modified, and alternate wildlife accommodations are advanced into the project design phase. All plans, details, and special provisions for wildlife accommodations are incorporated into project development by the Design Team. Issues that arise during final project development that have an impact on the implementation of wildlife accommodation(s) must be discussed with the Design Team to determine if a feasible alternative can be identified. Changes to the WADR decisions should be documented in subsequent milestone reports.

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